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EDITORIAL NOTES.

The Trade Prospect.

THERE have been prepared for the "JOURNAL" pages two articles dealing with statistics bearing upon the industrial situation; the one commenting upon information contained in the Board of Trade annual abstract, the other reviewing the course of trade during the past six months.* The object of such reviews is, of course, to afford all possible data upon which business men, who cannot give the necessary time to the culling of such information from the various sources, may found an opinion as to the probabilities of the future. The past is passed, and we only study it for its bearing upon what is to come; but the part of the statistician is easier to fulfil with success than that of the seer. What can we say about the prospect, after studying the retrospect? There is a very general impression among business men at the present time, we find, that considerable revival of trade is pending. Those holding this opinion are able to adduce several facts in its support. First of all, it is urged that the advent of peace in South Africa will be followed by the advent in this country of very large orders for mining machinery, agricultural implements, railroad materials, and rolling stock. Then it is pointed out that the proposed extension of the tube railways, and the provision of increased travelling facilities generally, will give employment to a considerable number of works and workmen; that the purchase of British steamers by American capitalists should lead to more shipbuilding here; and that trade in the United States is very flourishing.

As to the first point, it has to be remarked that, while it is quite true that South Africa will have need in the near future of much that this country can supply, there will be keen competitors in the field, the principal of whom—Germany—is so badly off for business at the present time that she will be prepared to cut prices down to the lowest possible point to secure as many orders as she can. The "slump" in Germany has been more pronounced than here; so every nerve will doubtless be strained to get a good share of the South African trade. There will certainly be some access of business to our manufacturers as a consequence of peace; but we fancy that those who are looking for a big "boom" as a consequence will be somewhat disappointed. It must not be forgotten that the heavy orders for war material that kept so many shops busy in the Midlands during the past two years will not continue now that the pressing need for it is happily removed. The construction of tube railways, and the provision of increased facilities for travelling in and around London and other cities, will certainly in time give work to a good many hands, but only gradually for the present; and it must be remembered that during the past year or so locomotive builders and rolling-stock makers have been the exceptions to the rule of slackness, having enjoyed a very much greater measure of activity than other branches of the engineering trades. Unmistakable signs are, however, now to be observed that the period of activity is drawing to an end. Any access of fresh business to the manufacturers in question in the coming months would, therefore, serve rather to maintain the volume of their trade than to cause an inflation.

In regard to the purchase of British steamers by the Pierpont-Morgan interests, it must be remarked that such purchase does not, *ipso facto*, increase the volume of traffic across the Atlantic so as to call for the construction of steamers on this side to replace those sold; while the figures that are published show plainly that a slackening in the pace of shipbuilding must very soon be witnessed—has, indeed, begun, for the returns for June of the Unions in the trade show that 6·8 per cent. of members were out of employment, as compared with 5·7 per cent. in May, and 3·2 per cent. a year ago.

* The former article appears to-day (p. 206); the latter is unavoidably held over till next week.

The one factor in the situation that is having an undoubted stimulating effect upon British trade is the tightness of the iron market in America. The iron and steel works there are not able to cope with the demand, prices have risen materially in spite of the efforts of the Trust to keep them steady, and order-books are already filling up for 1903. Whether this will lead to any really heavy quantities of iron and steel being imported into the States in spite of the substantial tariff duty, and whether the bulk of such imports as take place will come from Great Britain or from Germany, remains to be seen. But it should be noted that exports from this country to the States have risen during the past six months from 67,000 tons in 1900 and 51,000 tons in 1901 to 135,400 tons, and that more than half of this rise took place in the month of June. An increase in shipments at the rate of over 400,000 tons per annum, if continued for many months, would have a decidedly quickening effect on the iron market here. Prices have already gone up 8s. a ton since the beginning of the year, and the absence of heavy stocks is a feature in the situation. There is, however, so considerable a margin of plant not in blast at present, both in this country and on the Continent, that there is no fear of a shortage unless the drain to the States increases seriously. The difference between the number of British furnaces in blast now and two years ago represents a productive capacity of about 1,400,000 tons per annum.

Taking all factors into account, then, our opinion is against the expectation of a big revival in trade during the coming months, though we think that the downward movement that was so pronounced in the latter end of 1900 and during 1901 has been checked for the present—a circumstance favourable to sellers of coke, seeing that the time is near at hand for negotiating new contracts with some of the biggest consumers. The course of events on this side of the Atlantic must, however, depend to such an extent upon the position of affairs across the water, that we must make a reservation on that account, as well as in regard to the possibilities of disturbance through labour disputes. The fact that the railway companies are renewing coal contracts at 8s. 9d. instead of 9s. per ton is a happy omen.

The Requirement to Make Municipal Trading Self-Supporting.

WITH reference to the precedent of the Bermondsey Electric Lighting Order, which provides that the municipal electricity supply undertaking shall not be carried on at the expense of the ratepayers, it seems a reasonable suggestion that chairmen of gas companies throughout the United Kingdom, who will shortly meet their shareholders, would do well to make public the amount in which their property is rated for the maintenance of competing electric lighting ventures. If this were generally done, a decided fillip would be given to public interest in the matter, which might in due course bring about an extension of the precedent to other localities where it is equally needed. It is an outrageous proposition that a ratepayer should be called upon to support a commercial undertaking of the local authority, from which he can not only never derive any sort of benefit as a citizen, but which also competes unfairly with him in his business. It is unnecessary to labour the point; but unless gas companies are to be regarded as lying outside the ordinary considerations of fair dealing which are constantly being asserted on behalf of various orders and classes of the community threatened with wrong on the part of their rulers, a protest of this kind must carry weight. It is only necessary to remember the indignation of certain opponents of the Government Education Bill at the prospect of being rated for purposes of which they do not approve, and likewise the agitation of the ironmongers against unfair municipal trafficking in the specialities of their trade, to perceive that the principle of the Bermondsey precedent is wholly in accord with this natural sentiment. We are able to invoke with a clear conscience the support of the ironmongers for this protest, having on a previous occasion expounded and advocated applying

the law of fair pricing in the retailing of various appliances by gas companies.

There would be very little heard of the beauty of the "principle" of municipal trading, if the Bermondsey precedent were made universally applicable to the so-called reproductive enterprises of local authorities. It is admitted by an electrical journal that "if the gas, railway, and other "large ratepayers combine against the grant of Provisional "[electric lighting] Orders to local authorities, they will no "longer be granted." This dictum needs a little interpretation. Mere opposition to the proposals of a local authority, whether by one large ratepayer acting alone, or by several in combination for this purpose, will not often prove effectual. There is on the part of the Government Departments concerned with the supervision of the actions of all such authorities a general disposition to concede that they know best what is good for their localities. They are the elected of the people; and their credentials therefore bear a high *primâ facie* value. There is, consequently, a constitutional reluctance on the part of those departments of the Central Executive Government whose care it is to encourage local self-government, to override and go behind any normal decision of a well-reputed local authority. Sometimes, indeed, positive injury is inflicted upon communities by the operation of this rule. Local authorities which only represent a section of the population of a place, or whose election has been "gerrymandered" with a particular object, are treated with undeserved respect, and dealt with not for what they really are, but for what by the theory of government they ought to be.

It is therefore against the abnormal, the extravagant, and the ill-founded in the projects of local authorities large or small that ratepayers' opposition can be hopefully directed. There is not much in the suggestion that an objection of a gas company as such to an ill-considered electric lighting venture would gain by the association with the company of another large ratepayer, such as a railway company. Their cases are not on all-fours. At the same time, the association of all objecting ratepayers, large and small, of every kind of local interest, would be useful in pressing the requirement that every trading enterprise of the local authority should be self-supporting. There is plenty of precedent for this requirement. In the present session, the Rhondda Valley Tramway Bill was a scheme to saddle the ratepayers of the district with an outlay of £290,000 for tramways which it is very doubtful could ever pay; and in sanctioning the construction of the work, Parliament stipulated that it should only be undertaken in the event of a suitable lessee being forthcoming who would guarantee payment of the sum required to obviate burdening the rates with any capital charges. Another cardinal point is the obligation to prepare annual estimates of revenue and expenditure, and adjust prices so as to make both ends meet. This is, of course, the Scottish way of administering a municipal trading department; but it has been studiously shunned by the modern partisans of "the principle" in London and elsewhere, with the disastrous results we all know. It has all along been the cue of English Progressives to sing the praises of Glasgow and other enterprising Scottish municipalities who do all manner of things in the way of trade, with general consent. But these perfervid apostles of a cause they do not understand have ignored the controlling fact of the situation of these burghs—their system of finance. A Scottish municipal undertaking is made to pay its own way; and in order that there may be no mistake about it, an annual estimate of the capital and working expenses is carefully prepared by responsible officials, and the prices to be charged are adjusted to balance the account. The rule of English Progressive municipalities is to squeeze any paying undertaking (such as the gas supply) for the benefit of everything else, and to cover up the loss on others in every possible way. This line of conduct it is that has brought municipal trading in England under suspicion, and enabled the South Metropolitan Gas Company the other day to carry a proposal for at least putting it upon an equitable basis in certain localities. That is enough for the time. Talking round and about the "principle" is merely beating the air.

There is nothing selfish in this conquest, for which electric lighting companies have reason to be as thankful as gas companies. The example of Brighton and Hove can be cited as illustrating this point. Brighton is supplied with electric light by the Corporation at a fancy price, which does not pay. Hove is lighted by a Company, which has not the rates to fall back upon, but nevertheless continues to live and pay a dividend of 8 per cent. It earns profits at the rate of nearly 7¾ per cent. on the mean capital expended. As such concerns go, it is a paying business. Its municipal neighbour is not; and for the usual reason—the price is cut too low, for the glorification of the Corporation. There are certain residents in Brighton who do not approve of this policy of their Municipality, and are bold enough to say publicly that the directors of a company would not dare to treat the shareholders so. Whereupon an ardent advocate of municipal trading declares—evidently thinking it a "clincher"—that "if the Brighton electricity "works were run by a company, as at Hove, the consumers "would have to pay about twice as much for their current "as they are paying." This is an excellent instance of the argument that proves too much; for, clearly, if a well-managed company would require to charge twice as much as the current Brighton price in order to earn an average profit of 7¾ per cent. on the capital employed, the Brighton charges are by so much too low, and somebody—the ratepayers, in point of fact—must make up the difference. Why should they do it? Obviously, it would be in order to extend the Bermondsey precedent to Brighton on the first opportunity. If the Brighton Corporation are dealing fairly by the ratepayers, this will not hurt them. If they are not, it will do both them and the ratepayers a world of good.

Parliament and Private Bill Procedure.

CONSIDERABLE interest always attaches to the discussion by Parliament of the perennial subject of the possible reform of Private Bill Procedure. There is a Select Committee of the House of Commons actually considering this question; and some very valuable evidence respecting it has been taken. Mr. J. W. Lowther, Chairman of Ways and Means, agreed that it would be both desirable and possible to get Bills ready for discussion in Committee earlier in the session; but it would be necessary for them to be deposited earlier—say, by the 1st of November. This witness was strongly opposed to making Private Bill legislation cheap. He was in favour of keeping up the fees, not with the object of putting parties to expense, but because cheaper Acts would only encourage speculators more. In his opinion, the cost of obtaining a Private Act forms a test of the good faith of the promoters. He would also be glad to see a Standing Order to prevent anybody troubling Parliament by Bill for anything that could be obtained by Provisional Order, or by applying to a Government Department. This would relieve Parliament of a great deal of unnecessary work, and be a check upon the expenditure of local authorities. Mr. Lowther greatly objects to the present habit of moving instructions on Private Bills. The Speaker's Counsel agreed with Mr. Lowther that the fees payable on Private Bills should not be reduced, and would like to see some limited power of awarding costs given to the Court of Referees. He considered that the system of Provisional Orders saves expense. Mr. Pritt, a Parliamentary Agent, declared that it would be practically impossible to put forward Private Bill business by a month, or even a fortnight, earlier than December 21, the date now fixed for the deposit of Bills. Mr. Halsey, Chairman of the Committee of Selection, was strongly in favour of consolidating the inquiries in Committee of the two Houses into one. A predecessor of his—Mr. Mellor—was of the same opinion; holding that there are no cases that could not be satisfactorily dealt with in this way. He also favoured the Provisional Order system, and thought well of local inquiries. On the whole, the evidence does not reveal the existence of any serious defects in the present system.

Arbitration on the Price of Gas Lands and a Claim for Consequential Damage.

A CURIOUS arbitration has taken place, as will be seen by the report elsewhere, between the North Pembrokeshire Gas and Water Company and a local Estates Company, over the price to be paid by the former for a piece of land compulsorily purchased from the latter. A certain amount was claimed for the land, and nearly half as much again for "injurious affection" of the remainder of the estate. It appears that originally the Land Company were only involved with the Gas Company as owners of an estate on

which was a house within the statutory limit of 300 yards from the site proposed to be taken for the gas-works. In this capacity, they were served with a parliamentary notice. They thereupon proceeded to acquire the gas-works site, which put them in the position of being able to prefer a claim for compensation for injurious affection of the other piece of land. As a matter of fact, the Estates Company did not become possessed of the whole of the lands until after the Gas Company's Bill was passed; but they declared that they had commenced to treat for it long before the Company moved in the matter. It is the remarkable legal complication that calls for notice, because it is only as part of the same holding that the Land Company have any right to compensation for injurious affection of the portion of their estate not required for the gas-works. If the transfer of ownership had not been completed, no such claim could have arisen. The owners of the house in respect to which the parliamentary notice had been given could have opposed the Bill; but they would not have had the right to compensation now preferred, which was tantamount to a claim for severance. Incidentally there was a question as to which stage of such proceedings is to be held as debarring other dealings with the land. One side desired this critical period to be dated from the issue of the parliamentary notice, while the other side wished it to be deferred until the service of the notice to treat. It seems, as we have already observed, a remarkable state of the law that possession of a piece of land required for a gas-works should entitle a person to be paid compensation in respect of another piece of land at a distance, for which a different owner would get nothing at all. The Arbitrators gave no sign as to what they thought of the rights of the case; but this is bound to come out in the award when it is published. It is quite possible that after this the ultimate decision may rest with the Courts, on the question of law which will arise in regard to the facts found by the Umpire. He must decide in favour of the estates involved being in one or in different ownerships at the critical period; and either decision will be a grievance to one of the parties.

The Colliery Lads' Strike in Yorkshire.

The lot of the colliery manager in this year of grace is certainly "not a happy one;" for one labour difficulty follows another like showers on an April day. It is to be hoped that, like April showers, they will speedily pass and do little damage; but the spirit being displayed by the men in some parts of the country is not promising of peaceful times. The latest development is in the Federation districts, and is an outcome of the reduction in wages awarded by Lord James—an award that has been received by the men with the worst of grace, in spite of their leaders having recommended them to agree to it when proposed by the employers. Last week, without any notice to their masters, or any attempt to get their supposed grievances examined by the Federation with a view to redress being asked in a proper manner if the Federation endorsed their complaints, the pit "boys" (ranging in age up to 24 years) at some of the Yorkshire collieries refused to go to work because, they alleged, reductions had been made in their wages in excess of the reductions awarded by Lord James. The "boys" who began the movement made a tour of other collieries—incidentally committing sundry acts of ruffianism—with the result that at several more pits the "boys" left work, until some 15,000 miners were rendered idle in consequence of there being no lads available.

To what extent these boys and young fellows were egged on to take such steps by the lower-class miners—who do not mind "playing" on 9s. a week "out of work" allowance from the Federation while the fine weather and cricket are to be enjoyed—it is impossible to do more than surmise. But there is no doubt that their action meets with the strong disapproval of the Federation officials; for it tends still further to weaken their authority in the eyes of the employers. The "boys" have ignored the Union altogether, playing off their own bat, without giving notice to their employers or any opportunity of intervention to Mr. Pickard. The latter, while advising the "boys" to go back to work and then tender proper notices to their employers (advice which the "boys" have so far not heeded), took occasion to make a speech in which he appeared to consider that there was probably ground for the complaints that the employers had taken advantage of the award to reduce wages beyond the terms of that award—a gratuitous insult to the employers which will not strengthen his influence with them, and which elicited an immediate reply from the Owners' Association. From that reply, Mr. Pickard learned what he should not have needed to be told—that "special care has "been taken, so far as the Association is concerned, that the "reduction should be made in strict accordance with the "award of Lord James of Hereford; and should any errors "have been committed . . . prompt steps will be taken "to rectify them." What steps the owners will take to punish these young hooligans, or how far the trouble will spread before it can be squelched, we do not know; but it is a scandalous thing if a few hundred boys are to be allowed to throw thousands of men idle, and to disorganize the coal trade, whenever they think, or pretend to think, they have some grievance in regard to wages, without bringing any serious consequences upon themselves. We await developments with interest.

More Restlessness of the London County Council.

Not to miss an opening for its famous policy of hampering and loading private enterprise with all manner of restrictions, the London County Council are advised to stir up the Government to legislate against carburetted water gas. This is the real meaning of the proposal put down on the *agenda* for to-day's meeting of the Council, the terms of which will be found in another column. Of course, the preliminary investigation into the part played by carburetted water gas in the supply of London was confided, as a matter of form, to the Chemist's Department; and on the report of the Chemist, the Public Control Committee advise that the proportion of carbonic oxide in London gas should be limited by law to 14 per cent. This is the spirit in which our local authorities "encourage" a native industry. There was no doubt whatever as to what the Chemist's Department would advise. Always more inspection, more regulation, more officials to hold the industry in leading-strings, more penalty testing! What else are official chemists for? The world has indeed long ago passed beyond the phase of the development of civilization when the highest wisdom in the treatment of an industry by the Government was believed to be to "let it alone." Politicians still babble of Free Trade; but the London County Council would like to change all that for every kind of regulation and tethering. Think what it means to give all the force of a law to this latest example of the interfering propensity of the London County Council. A whole body of analytical practice would have to be established, every point of which could be contested. Who knows what is the degree of accuracy of carbon monoxide testing for gas; and what is the value or meaning of the test when obtained? There is one thing certain about the proposal—that complete lack of anything like the judicial spirit in everything that has hitherto emanated from the Public Control Committee of the County Council with respect to the operations of any kind of private enterprise renders their counsels suspect to the last letter. The *animus* that they have exhibited against the London Gas Companies one and all, irrespective of the public records of these undertakings, is a crying scandal. Where there was no shadow of public discontent with a Gas Company, the London County Council have nevertheless displayed, in regard to every one of the Companies' plans and proposals, a bitter spirit which can only be described as spite. Consequently, it is not to be wondered at that the restlessness of the Council in respect to Metropolitan gas matters is set down to malice, probably of Trade Union origin, and not to any real solicitude for the public welfare.

The Paris Gas Question—Government Action.

It is almost six months since we last discussed the state of the Paris Gas Question; and in the interval something has happened. A new Chamber of Deputies has been elected, to which the old Chamber courteously left the solution of this question, which does not appear to possess much interest for the professional politicians, albeit it closely touches the financial future of the capital and its population for the next fifty years. At any rate, the new Administration have not hurried themselves over the preliminary stages of the affair, having only lately deposited in blank a Bill for regulating the organization of the gas supply of Paris. Upon learning this, a representative of the

Metropolitan members in the Chamber asked the Government to send their Bill to a Special Committee, instead of one of the ordinary Committees of the Chamber. Thereupon a prolonged debate took place over the preliminary question of how the proposed Committee should be selected, which was only stopped by a suggestion emanating from the President, to the effect that it would be advisable to wait and see what the Bill was like. A deputy who has taken a rather prominent part in these negotiations, M. Jaurès, interrupted the proceedings with a proposal that the Committee to deal with the gas question should be nominated by the Chamber, publicly, and be subject to a vote. This procedure is permissible by the rules of the assembly; but the Chamber would not have it. Consequently, the nomination of the Committee will proceed in the ordinary manner. No date is fixed for this business, inasmuch as the Bill to be considered is not yet printed. Truly, they do not pass reforms in a hurry in France. Meanwhile, Paris waits for an indefinite time to learn how her new masters think she had better get her gas supply for the future. It seems a very curious situation. The solution favoured by the Government may or may not be that already approved by the Paris Gas Company and the Municipality, who between them own the property; or it may be something wholly fresh and unsuspected. In the latter event, there will be a protracted investigation, and repeated reference of the matters at issue to those affected by them; for not more in France than in England is it the practice to deal high-handedly with a man's property without giving him an opportunity for recording his opinion on the project. Several years have already passed since the question of the succession to the Paris Gas Company was actively mooted; and an agreed scheme in this regard is not yet in sight.

Some Account of Texas Oil.

An interesting account of the Texas oil-field recently appeared in "The Times," from a visitor to the now famous centre of the new petroleum supply at Beaumont. Though the writer disclaims all personal or business interests in the subject, he exhibits a large amount of knowledge of mineral oil, for an amateur; and it is almost needless to remark that amateurs of oil are not quite so common as amateurs of music or painting. It is a singular taste. At any rate, this eye-witness asserts that whereas some eighteen months ago Beaumont was only a sleepy Southern village, within six months more than 400 companies had been organized under the laws of the State of Texas, with a gross capitalization of nearly $250,000,000. Meanwhile, not much had been attempted in the way of refining the crude product, which is now being set about on a large scale. The oil contains some sulphur, and so little naphtha and kerosene —under 20 per cent. together—that the Standard Oil Company are reported to be indifferent to the new supply. The intermediate and heavy oils constitute the bulk of the new petroleum; and these are only useful for burning or gas making. Even so, their volatile accompaniments must be driven off, and the sulphur, if possible, reduced. This can be done, it is reported, by a simple blowing process; after which the oil ought to sell at from 20c. to 50c. per barrel. Locally, the new fuel is stated to have already had the effect of lowering the coal prices from $1 to $1·50 per ton. The export trade to Europe is still in the discussion stage; "before it can become practical, the whole scheme must "develop into a settled business." Just so; and there is a good deal to be done before this stage is reached. "The "extent and the probable steadiness of the field must be "determined, storeage facilities must be provided, and large "quantities brought above ground to ensure a supply, specu-"lation must give way to certainty, and (most important of "all) the shipping interests must develop carrying facilities." It is interesting to note that the Texas oil-field is physically the opposite of the Caucasian. The site is only 23 feet above sea-level, and 14 miles of flats separate it from Port Arthur, where there is a ship canal into the Gulf of Mexico. With these natural advantages, it should not take long to clear up the position and prospects of Texas oil.

The Gaslight and Coke Company's Dividend.

We learn from the Secretary and General Manager of the Gaslight and Coke Company, Mr. John W. Field, that the accounts for the half year ending the 30th of June last show that (subject to audit) the balance to the credit of the net revenue account will enable the Directors to recommend, at the general meeting on the 1st prox., the payment of a dividend of 4 per cent. per annum, carrying forward a balance of £68,165. This time last year the dividend was at the rate of £4 8s. per cent. per annum, and the balance was £97,993; while in 1900, with a dividend at the same rate, it was £296,755. In two years, therefore, there has been a drop to the extent of £228,590—first of £198,762, and next of £29,828—in the balance. and of 8s. per cent. in the dividend.

Sulphate of Ammonia Committee.

The annual report of the Executive Committee of the Sulphate of Ammonia Committee testifies that they have not relaxed one whit their work as propagandists of the merits of sulphate of ammonia, nor is there any sign that they are likely to. There is, on the contrary, plenty of evidence in the report that increased interest is being taken in the efforts made by the Committee for spreading knowledge as to the virtue of sulphate as a fertilizer. Of 85 competitions organized by Agricultural Societies for the Committee's prizes in the past season, 80 were successfully carried out. This is good; but the outlook for this year is better—applications having been received from Societies to arrange 101 competitions. The circulation of literature has also been going on apace; and there is, as the result, a satisfactory indication of increased interest in the subject among agriculturists. It is rather surprising to learn that "numerous communications" have been received from farmers in different parts of the United Kingdom complaining of the difficulty they have experienced in obtaining sulphate of ammonia; and this has been particularly noticeable with regard to Ireland. It is rather disappointing to find that a greater number of gas undertakings do not join the Committee; but there have been some important additions this year—viz., Edinburgh, Manchester, Malvern, and Scarborough. Perhaps these will induce others to join. The greater the number of subscribers, the greater the means for carrying on the work, in the results of which all gas undertakings share.

Illuminations and Gas Consumption.

The article we recently published on the effect of holidays and illuminations on gas consumption has put beyond the range of doubt the fact that even fairly extensive illuminations on the occasion of a public holiday do not compensate for the loss of the gas which would otherwise be consumed under normal conditions. Mr. Charles Wood, the Corporation Gas Engineer of Bradford, has sent corroborative figures obtained from the experience of Monday last week, which was observed in that city as a general holiday. At night time the illuminations were in full swing; and it was seen that gas had its fair share of patronage. The consumption, however, amounted to only 2,265,000 cubic feet, as compared with 2,677,000 cubic feet for the second Monday in July of 1901—that is to say, there was a round loss of 400,000 cubic feet in the consumption. But Mr. Wood at the same time supplies figures which go back six years, and which show that there was nothing on the day named last year to vitiate the comparison. In fact, the figures for this particular day of the six years are remarkably uniform, considering the increase in consumption over that period; and they seem to suggest that July (which, of course, is a low lighting-consumption month) has not contributed a fair quota to the general increase. In 1897, the consumption, on the second Monday in July, was 2,564,000 cubic feet; in 1898, 2,554,000 cubic feet; in 1899, 2,819,000 cubic feet; in 1900, 2,709,000 cubic feet; in 1901, 2,677,000 cubic feet; and in 1902, 2,265,000 cubic feet. However, the last two sets of figures are the ones in which we are most interested at the moment, in view of the public holidays and the illuminations.

Mantle Dealers and Welsbach Licences.

We cannot longer shut our eyes to the fact that there is trouble brewing in the mantle trade over the question of the Welsbach licences. Some of the licensees are asking, with a little bitterness in their tone, what the Welsbach Company are going to do with those traders who have not taken out licences, and who seem to be driving a fairly good business in defiance of

the Welsbach Company, agreements, and licences. It was only to be expected that the Company would grant the trade a little grace, in order to determine whether or not they would take out licences, before entering upon a fresh course of litigation. But the (to-day) nonconformist part of the trade have now had full time to make up their minds; and, therefore, those who have bound themselves to the payment of a royalty have a perfect right to expect that some movement shall be made to protect them. One unlicensed trading house is waiting, before taking out a licence, to see whether the Welsbach Company really intend to fulfil their part of the agreement with the licensees, by instituting actions against dealers who do not apply for a licence. This is rather amusing; and it will be still more amusing if the Welsbach Company start their fresh invasion in that particular direction. However, whether that be so or not, we shall not be surprised to hear of action being taken almost immediately in one quarter or another; for last Friday the Welsbach management and certain of the principal licensees were taking counsel together—rumour says on this very subject. It is also questioned by one or two of the licensees whether the Company will be able, at the end of the first six months, to compel payment of the trade royalties if they do not show, by taking action, that they intend to enforce the rights of those who have placed themselves under the agreement. Meanwhile, it is reported that the Welsbach Company have been restrained from threatening with legal proceedings anyone concerned in the manufacture, sale, or use of a certain unlicensed mantle, and from alleging that it is an infringement of any patents belonging to the Company. It looks as though there is to be a recrudescence of litigation; but if there is, it is not likely to be anything like so protracted or so unsatisfactory as the old campaigns. The present direction of the Welsbach Company will not let the grass grow under their feet when once they start defending themselves and the licensees, if the necessity arises. Even if there is to be litigation, it is a consolation to the gas industry to know that it cannot adversely affect the price of the cheap mantles now lawfully purchasable.

Saving in Labour by Coke-Conveyors.

There is an interesting little fact buried away in the speech of Mr. R. Hesketh Jones at the annual meeting of the European Gas Company, Limited, which is worth bringing into more prominence. He states that at Havre a coke-conveyor, with gas-engine and a coke-crusher attached, is now in full working order; and, from the experience of the first six months of this year, the saving in labour appears to be equal to about 6d. per ton of coal, or £1200 a year. This is a very interesting statement; but gas engineers will no doubt wish that Mr. Jones had taken it a little further. It may be mentioned, however, that nothing has been deducted from the saving for repairs and renewals, or for anything else. But even allowing for such charges, the saving will be a substantial one on the total quantity of coke dealt with, which can be estimated from the figures given, indicating as they do, that something like 48,000 tons of coal are carbonized in the course of the year. The conveyor, which is a strongly constructed De Brouwer, has only been fully at work for about six months; so that the precise charges which will have to be made are not yet known. But perhaps in twelve months' time Mr. Jones will be able to speak a little more definitely, and make an interesting comparison.

More Free Information Wanted.

The desire to obtain information of a business character, without making the recognized business acknowledgment, seems to be widespread. That is to say, there are a great number of people who either do not or will not recognize that professional opinions should be paid for the same as other requirements have to be. So long as there are capable consulting engineers whose work it is to advise on professional subjects—and it cannot be urged that the gas industry suffers from a lack of such men—there is no excuse for troubling other people on matters that can be just as well dealt with by them. We say no excuse, though one reason for it being done is clear enough—that the consulting engineer's fees may be saved. Probably inquirers of this kind do not fully realize the injustice of their conduct; and hence it may not be amiss to once more point it out to them. There should be, and we doubt not is, a feeling of brotherhood between those engaged in the gas industry; but this should not be taken undue advantage of. And, besides, this same feeling should entitle the consulting engineer to consideration from persons who are in need of services such as he is able to perform. There are of course, various kinds of inquiry circulars. Some are sent out with the object of benefiting the industry at large; and these are worthy of every attention. Others have for their aim the securing of information which it would be difficult, if not impossible, to obtain by any other means. But there is another class—and it is a far too common one—in regard to which neither of these explanations holds good; and it is with reference to this class that the present note is penned. We have before us a letter addressed from the office of a gas company to the engineer of another works, in which information is asked as to which particular Silkstone coal gives the best yield of gas, and whether nuts are found to be satisfactory. It had been noticed by the writer that the engineer in question was advertising for tenders; and in the expectation that the form might specify the requirements as regards colliery, &c., he asked to see one, "if agreeable." We, however, search the letter in vain for some explanation of why such a request for free information should be made of the engineer to whom the letter was addressed, when there are plenty of properly qualified men whose business it is to answer questions of this character. Why not apply to one of them, instead of worrying people whose time and attention are already fully occupied with looking after their own affairs?

The Osmium Electric Lamp.

This wonder-creating lamp which has been so long talked of, and has been used from time to time in days gone by to revive the depressed hopes of those confiding investors who dropped their money into the Welsbach pool, has not yet reached the desired development, although an appalling amount of money has been spent in trying to attain it. Our authority for saying this is the report of the Directors of the Austrian Incandescent Company. There they say: "Owing to technical difficulties, such as necessarily occur in every new branch of manufacture, the production of the Osmium lamp, has unfortunately not yet reached the desired development. The results obtained hitherto in the preparatory stages of manufacture are, however, so favourable that nothing stands now in the way of starting the manufacture on a large scale." There is something distinctly contradictory about the statements in this paragraph, through perhaps faulty diction on the part of the Directors of the Austrian Company or translation. "The production has not yet reached the desired development;" still "nothing stands now in the way of starting the manufacture on a large scale." Some explanation is needed in order to reconcile these statements; but perhaps that will be forthcoming at the meeting of the Welsbach proprietors to-day. Meanwhile it is interesting to learn that the Directors of the Austrian Company have, during the past financial year, sold a moiety of the French, Spanish, and Portuguese patent rights of the Osmium lamp to the Société Française d'Incandescence par le Gaz for the sum of about 1,000,000 frs. (£40,000) It will be a relief to these people, as well as to the Welsbach shareholders, when the fate of the lamp is really known.

Robbing Peter to Pay Paul.

The history of municipal trading has furnished many examples of one department being called upon in some way to assist another; but when this has happened, it has usually been the electric light works that have been favoured. This, however, has not been the case at Salford, where for the past eight years or so the Gas Committee have enjoyed the privilege of purchasing the coal required by all the departments of the Corporation. Among these were the electricity works, which have up till now shown an annual deficit—thus rendering it necessary to economize where possible. The coal consumed by the department amounts at present to 14,000 tons a year; but it is anticipated that later on this may be increased to 40,000 tons. The Gas Committee, for the trouble of passing the purchases through their books, charge the Electricity Committee 1d. per ton commission; and this sum the latter Committee, having regard to the unsatisfactory state of their finances, are desirous to save. We are glad to see that the Council have agreed to allow them to try to do so,

by granting them permission to henceforth purchase their own coal. This seems only a fair thing to do. Of course, these profit-showing book-keeping arrangements between one department of a corporation and another do not directly affect the ratepayers; for it is merely a question of taking the money out of one pocket and putting it into another. But it is only natural that each one should be anxious to make the best showing possible; and this cannot be done when one seeks to make a profit out of the purchase of raw material for the use of another. There seems to be no reason why two departments of the same corporation should not be able to purchase coal on equally favourable terms.

Prepayment Meter Law.

A case with reference to the custody of prepayment meters, of a somewhat, though not quite, similar character to two which were a few weeks ago decided at Longton and Chester, came last week before the Magistrates at Newport (Mon.). A consumer left his house, and thereafter the money he had placed in the prepayment meter was stolen. It was not denied that the gas had been consumed; the only question to be decided being, Who should bear the loss of the money taken? As in the two previous cases, the consumer was made responsible, and has thus to pay a second time for his gas. This may seem hard on him; but then someone had to suffer, and that the liability has been laid upon the right shoulders can hardly be doubted. As one of the local papers remarks, the meter was on the consumer's premises, and he was the custodian of it and of its contents. It was not sufficient for him to put pennies in the slot; he had to keep the money in safety, and to give the Company the opportunity to take away what was lawfully theirs. This, however, he failed to do. The writer remarks that, if the Bench had given any other decision than they did, it would have opened the door to the dishonest; to make the consumer responsible for the meter and its contents is at once common-sense and justice. With this expression of opinion we entirely agree, and we are pleased to see a newspaper take so unprejudiced a view of a gas company's claim. It is the duty of prepayment consumers to give due notice to the gas supplying authority of their intention to vacate their premises; and this is a course which is generally, if not always, insisted upon in the agreements such consumers are customarily called upon to sign.

WATER AFFAIRS.

Amending the London Water Bill.

The House of Commons devoted another afternoon on Friday to the consideration of the London Water Bill in Committee; and if it cannot be truthfully said that the five hours occupied were spent simply in "marking time," it would certainly not be in accordance with fact to assert that very much progress was made—the time being entirely taken up with the first clause. This, however, contains one of the vital points of the Bill—the constitution of the Water Board; and it is against this that the opponents of the measure are directing their attacks. The first amendment submitted was by Mr. Lough, who manifested a desire to strike out the words empowering the Water Board to "carry "on" the present undertakings; urging that the efforts of the Board should be confined to bringing in the water, and distributing it to the local authorities. The honourable member appeared to ignore the fact that the Board would not necessarily be bound to carry on the undertakings as now, but would be able to effect such reforms as they might deem advisable—even going to the extent of treating the whole of the separate areas as one. His proposal was altogether uncalled for, and the House rejected it, though the Government had only a majority of 29. He next tried to slip in an amendment to provide that the Board should supply water in bulk to the Local Authorities; but he again failed to carry his point. Dr. Macnamara then took up the opposition, and submitted a somewhat drastic amendment, to omit entirely the sub-section constituting the Board, which he characterized as a grotesque and unworkable body. Surely this would have reduced the Bill to nonsense. If, as Mr. Long pointed out, there is to be a Board at all, it must be constituted in some shape or form. As to its constitution, he reminded the House that the scheme of the Government had the support of the great majority of the representatives of the Metropolis and of the Metropolitan constituencies, and he should be prepared to defend it. At the same time, any proposals made for the reduction of the number of its members, which were not at variance with the principle underlying the constitution of the Board, might be left to the House. Thereupon the amendment was rejected.

This statement by Mr. Long seemed to open up the way for the constitution of a smaller Board; and Mr. Buxton accordingly came to the front with an amendment fixing the number at 35, though without committing himself to this precise figure. Sir Edgar Vincent, a member of the Joint Committee, expressed the opinion that a Board of 70 would be more directly in touch with the consumers than a smaller one, while for administrative purposes there was little or no difference between them. Mr. M'Crae, another member of the Joint Committee, as well as of the Edinburgh Water Trust, maintained, on the other hand, that a Board of 30 would be ample. In emphasizing his point, he commented in strong terms on what he regarded as interference by the Government with the Committee's freedom of action, which had led to the retention of the third schedule. After some discussion, Mr. Long said he should be willing to move later on to omit the end of the sub-section under consideration, and insert in its place this schedule, so as to bring the whole question of the constitution of the Board within the purview of the first clause. He added that he would even formally omit the specific number of members. This statement satisfied Mr. Buxton, and the amendment was withdrawn. Subsequently the sub-section was made to read that the Board should consist of a Chairman, Vice-Chairman, and "other "members." Mr. Cremer, the Liberal member for Haggerston, then moved to omit the Chairman and Vice-Chairman, in order that the Board might be free to determine whether or not there should be such officers, either paid or unpaid. Mr. Long thought the honourable member was not serious. He was, and he pressed the matter to a division, which went against him by a majority of 96. He was followed by a more successful member—Mr. Whitmore—who moved that the Chairman and Vice-Chairman should be appointed by the Local Government Board in the first instance, and afterwards by the Water Board. Mr. Long acknowledged that he had had considerable difficulty in arriving at a decision on this subject. It was thought to be desirable that the new body should, in its early years, be under the guidance of men clothed with authority. Mr. Lough look upon the proposal as one which would curtail the freedom of the Board, and cause it to lose its administrative ability and activity. Colonel Lockwood, on the other hand, considered that it secured, for at all events the first three years, a qualified and experienced Chairman. The majority of the House agreed with him; and the amendment was carried.

The chief feature of the discussion was undoubtedly the deletion of the number of members to constitute the Board. It will now rest with the House to determine what is to be the size of the new authority; and it will be interesting, in view of the controversy which has taken place over this matter, to see what figures they substitute for those that have been struck out. Of course, it will not be an insuperable difficulty to construct a smaller, and therefore, less "unwieldy" Board—one more nearly approaching the size suggested by Lord Llandaff's Commission. What the Government will insist upon, as Mr. Long distinctly told the House on Friday, is that the principle of the representation thereon of the Metropolitan Boroughs shall have due recognition. Ought they to have it? That is the *crux* of the question. Mr. W. H. Dickinson, the former Chairman of the Water Committee of the London County Council, thinks not, as set forth in his letter to "The Times" last Tuesday; and very much the same opinion is held by "A Consumer and Ratepayer," who follows him. With regard to Mr. Whitmore's amendment, we share the view expressed by Colonel Lockwood rather than with the more pessimistic one enunciated by Mr. Lough. Supposing the Board should come into existence, it seems to us that it will be a distinct advantage for its first few years' work to be done under experienced guidance. But at present it is in embryo. The Bill stood for further consideration after the Education Bill yesterday; and if we may believe what the new Prime Minister stated at Fulham on Saturday, if this Bill could be passed, the great interest manifested in the London Water Question—leading to its discussion hour after hour—would notably diminish.

ESSAYS AND REVIEWS.

THE LAST FRENCH TECHNICAL COMMISSION.

In the "JOURNAL" for the 15th inst., we gave an outline of the report prepared by M. Lauriol, the Chief Engineer of the Lighting Service in Paris, on the subject of the supply of gas in the city, and submitted to the above-named Commission for consideration. The examination of the report was entrusted to a Committee consisting of MM. Le Châtelier, Violle, Vincent, and Alavoine, who had power to call to their assistance any members of the Commission likely to be of use to them. As it was decided that the most important sections of the report were those in which the author dealt with the subjects of the Municipality entering upon the business of gas making, and of the value of the existing works, these were taken up in priority to the rest. At the first meeting of the Commission, M. Deville, a member of the Municipal Council, called attention to a number of questions submitted by the Gas Committee of that body in a letter addressed by him to the Prefect of the Seine, bearing upon the various matters dealt with in the report; and they were duly considered. Their nature will be shown in the course of our review of the proceedings.

The first question taken up by the Committee was that of the possible competitors with coal gas; and the conclusions arrived at on this subject by M. Lauriol were unanimously adopted. The Committee then considered the advisability of employing "poor" gas as an auxiliary; and M. Boreux pointed out how serviceable an installation of plant for its production would be in gas-works. M. Chesneau, a Professor at the School of Mines, acknowledged that he was not very favourable to the use of water gas; and he asked for information in regard to it. M. Lauriol explained that this gas was extensively used in England and Germany, without any increase in the number of accidents. After some further remarks, the matter was allowed to stand over. On the subject of illuminating power, it was decided to keep to the standard now required to be complied with by the Paris Gas Company; and M. Lauriol's proposal as to pressure (14-10ths) was approved of. The Committee of the Société Technique, who, it may be remembered, laid the results of the Commission's labours before the members at the last meeting, consider these decisions unnecessarily stringent, in view of the development of incandescent gas lighting and the improvements lately effected in burners adapted for the consumption of gas at low pressure. They support their opinion by a reference to what has already taken place in London, and what will probably be witnessed in the future, in the direction of lowering the illuminating power of gas. Returning to the proceedings of the Technical Committee, M. Le Châtelier asked them to reserve for consideration the question of sending out compressed gas, should circumstances call for it; and he expressed the opinion that authority should be given for the adoption of all methods of treating gas of such a nature as to improve it for the consumer's use. The Committee coincided in this view. As to the quantity of gas to be furnished, they adopted M. Lauriol's basis, being convinced that the reduction in price would have the effect of very largely increasing the consumption, if not for lighting, at all events for heating and motive power.

The project for the construction of new works was the next subject considered, with the result that the number and location of the stations suggested by the reporter were unanimously adopted. With regard to carbonization, it was thought a month's stock of coal was inadequate, and twice this storage capacity was decided upon. The Committee recorded their preference for continuous recuperation. On the question of retorts, M. Delahaye urged his colleagues not to eliminate entirely the inclined system. M. Le Châtelier, however, thought they ought to start without the possibility of accident, and he submitted that the system alluded to could be tried later on. The Committee adopted the principle of horizontal retorts, and also accepted M. Lauriol's conclusions in regard to the general arrangement of the settings, the number and distribution of the retorts, and the transport of coal and coke in the retort-house. These decisions were duly communicated to the Commission at their next sitting, and were adopted. M. Boreux pointed out that they answered in the affirmative one of the questions put by the Gas Committee of the Municipal Council, as to whether the Commission shared the opinion of M. Lauriol on the subject of the eventual competition of acetylene and electricity; while as to the probable increase in the production of gas, they agreed with the views set forth in his report.

An important question suggested in M. Deville's letter was whether the Commission considered the manufacturing arrangements favoured by M. Lauriol were preferable to those adopted in the new works of the Brussels Municipality; and this was taken up by the Committee at their second meeting. Of course, an answer could scarcely be given without an inspection of the works named; and accordingly MM. Delahaye, Deleury, Vincent, Boreux, and Lauriol were appointed a deputation to visit Brussels for the purpose. The question of the use of producer or water gas, which was held over by the Commission, was then discussed. M. Lauriol furnished details from the report of the Departmental Committee which sat in London in 1898 to show that an admixture of 30 per cent. of water gas with coal gas is used in the Metropolis, but that the writer of the report considered 20 per cent. of carbon monoxide to be the maximum limit admissible while anything above 12 per cent. should be subject to regulation. According to the rather divergent particulars he was able to procure, he reckoned at 8·26c. per cubic metre the total working expenses for carburetted water gas, and 7·43c. for coal gas; but, owing to the lower first cost of an installation of water-gas plant, he said the total expenses were practically the same. He pointed out that the advantage of this plant lay in its facility of operation; and its value in this respect could not easily be expressed in figures. M. Le Châtelier raised the question of the light-giving value of a mixture of coal and water gas employed for incandescent lighting. He remarked that a mixture containing 20 per cent. of water gas, when consumed by means of a Welsbach burner, had been credited with an increase of 5 per cent. in illuminating power. He questioned this result; at all events, it would, he said, be different if each gas were consumed with the burner most suitable for it. He also considered that the 60 grammes of benzol per cubic metre indicated by Dr. Bueb for the carburation of water gas must be accepted with caution. M. Violle shared this opinion. M. Lauriol suggested that the Committee should reduce the proportion of carbon monoxide to 20 per cent. in December and January and to 15 per cent. in the other months. M. Delahaye mentioned that some of the coals carbonized by the Paris Gas Company gave off as much as 11 per cent. of this gas, the average being 7 per cent. M. Le Châtelier thought that, leaving out of consideration the question of the toxic properties of water gas, a city of the importance of Paris should not undertake an experiment of this kind in the absence of documentary evidence which would allow of a decision being arrived at from actual knowledge of all the facts bearing upon the matter; and he suggested that, before anything was done, the proposed mixture should be studied from the point of view of its illuminating and heating value. M. Vieille closed the discussion on this question by alluding to the probable opposition the proposal would encounter in the Hygienic Council; and the Committee then proceeded to vote upon the two questions before them—the general use of water gas in the proportion of 30 per cent., and the use of 20 per cent. in December and January and 15 per cent. for the rest of the year. The members of the Administration abstained from voting, which was equal on both questions; so that the settlement of these points was left with the Commission.

The storage of coal was the next matter taken up. The Committee decided that the raw material should never be kept more than six months in stock, and confirmed their previous decision as to providing a supply for two months, which they said could be kept uncovered. With regard to the transport of coke after its removal from the retort-house, they adopted M. Lauriol's conclusions, at the same time pointing out that manual labour might possibly be required in the event of an accidental breakdown of the mechanical appliances installed. The recommendations of the reporter with respect to the various manufacturing operations, the electricity generating plant, the outlet mains, &c., were next reviewed and adopted. In regard to the treatment of residual products, the Committee advised that this should be confined to the distillation of tar, and that the operation should be carried on at the works. M. Boreux then put three questions to the Committee—the first bearing upon the possibility of having gas and electricity works in juxtaposition; the second inquiring as to whether there would be any inconvenience in amalgamating the two services; and the third suggesting the advantage of utilizing the waste heat from the retort-furnaces. The Committee considered it might be of advantage to establish electricity works as suggested, with the view of utilizing the coke; but they thought it extremely doubtful whether the waste heat from the furnaces could be profitably utilized.

The foregoing matters were laid before the Commission at their third meeting, when the question of water gas was again discussed. After an exchange of views, a proposition was submitted to eliminate water gas altogether; but it was rejected. It then remained for the Commission to settle the maximum quantity of carbon monoxide to be allowed in it. M. Sauton proposed to fix this at 12 per cent., and to give the Prefect of the Seine discretionary power to permit the limit to be exceeded. This was agreed to. A suggestion made to M. Le Châtelier in Committee, that the illuminating power of the gas should be ascertained at each station, and not on the whole of the make, was adopted, as were the other decisions come to. M. Deleury gave an account of the visit of the deputation to Brussels, where opportunity was afforded for witnessing in operation an installation of plant for the manufacture of water gas. He stated that it occupied very little space, could be brought into use in three hours (compared with the 48 hours required by the coal-gas plant) and needed but few men to attend to it. In the retort-house, they saw a bench of eight settings of inclined retorts which had been in use for several months. The transport of material was done by machinery; but provision was made for doing it by hand in case of a stoppage. The coal-stores and purifier-houses were inspected; and they formed, with the other portions of the works, an interesting study, in view of the eventual construction of new gas-works for Paris. The Commission put the cost of these, if arranged for the manufacture

of coal gas only, at 205,000,000 frs.; but with water-gas plant at 195,000,000 frs.

At the next sitting of the Committee, M. Le Châtelier expressed the opinion that the calorific value of the gas ought to be defined at a minimum of 5600 calories per cubic metre, and he pointed out that the tests could be easily made by the ordinary gas examiners, by means of the various calorimeters in use. This was the principal matter dealt with. At the succeeding sitting, the Committee were occupied with the question of the value of the existing works. M. Delahaye submitted some calculations he had made on this subject, the result of which was to bring out the sum of 163,383,240 frs. as the limit beyond which the construction of new works would not offer any advantage for the city. The accuracy of his conclusions was, however, contested by M. Le Châtelier, who, making a comparison with large gas-works in other countries, brought out a sum of 160,000,000 frs., from which he deducted 40,000,000 frs. for all the distributing plant; leaving 120,000,000 frs. He took as his basis 50c. per cubic metre of gas made per annum; but the Committee of the Société Technique pointed out, in their comment upon this matter, that, though this figure might be correct in reference to gas-works in England, where raw material is cheaper than in France, it was much too low for those in the latter country. This subject, and the estimates upon which the calculations were based, occupied the Committee at their remaining sittings, in the course of which they answered categorically a series of questions put by MM. Deville, Veber, and Grébauval. The whole of these proceedings showed the difficulty experienced in arriving at a figure for the net cost of gas per cubic metre in hypothetical cases.

When the Commission assembled at their concluding sitting, M. Vieille expressed regret at being absent when it was decided to limit to 12 per cent. the quantity of carbon monoxide to be allowed in the gas to be supplied in future. He reminded the Commission that he had addressed a letter on this subject to the President, and he dwelt upon the matters therein discussed—notably the danger of carbon monoxide, which he considered to be very great, and the limitation of the quantity. After an interchange of views on these points, the Commission decided that a rule ought to be formulated, but that it should be left with the Administration. The several decisions of the Committee in regard to the distributing plant, the value of the existing works, and the scheme for new ones were then adopted. With respect to the service-pipes, meters, &c., the Commission thought they should become the property of the parties managing the undertaking. The answers given by the Committee to the questions of MM. Deville, Veber, and Grébauval were approved of, as was their suggestion as to the juxtaposition of electricity and gas works; and the labours of the Commission came to a close. The Prefect of the Seine thanked the members—especially those of the Committee—for the valuable service they had rendered to the Administration. He said he should not dissolve the Commission, as, in the event of the necessity arising, he might desire to call them together again to render further assistance in the elucidation of the question referred to them.

THE CHEAP INCANDESCENT BURNER.

The challenge contained in the paragraph which appeared in last week's "Journal" headed with the notification "Wanted, a Cheap and Respectable Burner" has been taken up by three firms who make a speciality of the supply of incandescent fittings; and they have submitted to inspection burners which (we are writing without yet having had an opportunity of testing their lighting capability) have unquestionably the two virtues of being cheap and respectable, and cannot be mentioned in the same breath with the trashy order of goods which are now to be found in many retail shops, and the sale of which has been somewhat vigorously pressed. With these, gas managers can, in their own interests, have nothing to do; and now, with cheap mantles abounding, is the time to place in their hands good low-priced burners—well before the next lighting season comes along. There are gas suppliers contemplating the putting of incandescent burners into the houses of their prepayment meter consumers free. For such burners they cannot afford to pay a high price; and yet they want something that will give satisfaction and be durable. Again, gas suppliers—here, there, and everywhere—are taking up the maintenance system; and this will give them a favourable opportunity of extending by recommendation, with reasonable prices for installation, the incandescent system itself in the premises of those whose lights are placed under their care. Then, again, in the battle between the lights, it will be to their own benefit to take advantage of their constant intercourse with consumers, to advocate the greater adoption of lighting by this means on all convenient occasions. The order of the day is for gas suppliers to become more and more the expert lighting advisers to those they serve with their prime commodity; and the vendors of incandescent goods must not lose sight of this fact.

The paragraph above referred to ended with the inquiry, "Are there already burners available, but little known, of the character wanted?" Now, as said, there are firms, and they are numerous, who make a speciality of supplying incandescent fittings; but, if we may be allowed to express a friendly opinion—which may be taken as a suggestion—some of the firms do not sufficiently specialize their advertising, so as to bring prominently and concisely before gas managers (with, of course, variation of subject and matter) just the points they want to know. This is proved by the fact that cheap and respectable incandescent burners are supplied by firms, and yet there are gas managers who have seriously confessed that they do not know where the best type of such burners can be procured. Let us emphasize that we are not referring to the better class of well-known goods, but to burners possessing the four qualities of low price, good appearance, durability, and fair lighting capacity.* Some advertisers seem to forget that gas managers are like other members of the human species, and will not trouble to read through complex announcements dealing with a medley of articles to learn that (say) cheap and good burners can be obtained from Messrs. So-and-So; and they also find that six days a week and twelve-hour "shifts" are all too short to wander through several mighty and closely-packed catalogues to see what that is fresh is going. A "straight tip" goes home. "Incandescent burners are supplied by ——— at from — to —," and "For price list of cheap incandescent burners, address ——," printed in bold, striking type, will have more effect in the way of producing correspondence and business than cramped announcements. And the same hint applies to other articles.

This suggestion is a fair interpolation in this article in view of the last words (already quoted) of the paragraph published last week. But now before noticing the burners submitted to inspection, there is another point to be noted; and it is this that not only must burners be cheap and of decent outward character, but their performance must be such that no one can fairly take exception to them. Of course, there must be a reasonable allowance made between such burners and those specially designed for the production of a high duty, which must be charged for accordingly. No one would expect a burner which is supplied, on wholesale terms, at 9d. or 1s. to give, for example, a return in light of 25 candles for every cubic foot of gas consumed. There are, however, incandescent burners and incandescent burners; and some behave in a decidedly inexplicable way—in such a way in fact that, in the house of the ordinary consumer, they might be the means of condemning the whole system. This is a little chatty "talk," and so, for the moment, the editorial "we" may be dropped, in order to give a bit of personal experience, for the purposes of explanation and of showing what is not required. Now in the house of the writer, there are a number of incandescent burners fixed—two cheap ones, while the others were purchased at the time of high prices for ordinary incandescent burners. Fairness prohibits designation. Now the cheaper of the two cheap burners is fixed in a protected position; and it has been under trial for at least twelve months, until now it is doomed to dismissal as a wanton destroyer of mantles, and consequently an expensive servant. On that particular burner it has been found impossible to keep mantles for a week without fracture, and many "pop off" on first lighting; while no such difficulty was found with a burner which formerly occupied the same position, and for which a higher price was paid. The conditions are the same; and different makes of mantle have been tried on both burners with results as described. Why there should be this difference, no reason can be assigned, nor even a surmise offered. But the circumstances certainly seem to point to the burner having something to do with the destruction of the mantles. If this is so, it may be said at once that gas managers do not want burners the upkeep of which is costly. The second cheap burner—which was not so low-priced as the one already mentioned—was bought some eighteen months since; and it is fixed in a room at the top of the house. There the light afforded by the burner—strict attention being given to its cleaning and the regulation of the gas supply—is not nearly so good as can be obtained by a burner of a different make (which cost but a few pence more) fixed on the same bracket. Now these are facts; and the writer fails to find any adequate explanation, unless rough, unscientific construction has something to do with it. Let it be clearly understood that neither of the burners is new; but the same experience has continued since both were new. It is fair to say too that neither of the burners was made by the three firms who have replied to the statement made last week by submitting cheap burners for inspection. Furthermore, this experience is not given for the purpose of disparaging cheap burners, but entirely in order to give further illustration of what gas managers do not want for their consumers, and what in these

* To these qualifications for an incandescent burner, Mr. Charles Carpenter, in our "Correspondence" columns, adds another; and it is this, that a burner should be so constructed as to render the cleaning a facile matter. Not only does he make this suggestion, but he gives an illustrated idea of how it may be done, so that readers who are interested in the maintenance question may try it for themselves. The point is one of importance. The removal of the burner top when it is tightly screwed is sometimes a difficult matter without cracking, and occasionally even destroying, the steatite ring; and it is found now and then essential in dusty places and in bedrooms (where fluff is drawn in with the air) to get to the gas-injector in order to clear it from obstruction. It is, of course, necessary that everything possible should be done to enable the maintenance men to perform their work expeditiously, and consumers who are not under the system to readily clean their own burners without doing them mischief. This is what Mr. Carpenter's suggestion aims at.

days it will not long pay burner makers to supply. Cheap burners are wanted, but not such as are described here.

Now the three firms who have responded with "cheap and respectable burners" are Messrs. Falk, Stadelmann, and Co., the Wholesale Fittings Company, and Messrs. J. & W. B. Smith. The burners they have sent have not yet been tested by ordinary use; but they will be in due course. Meanwhile, it may be admitted that for cheapness and respectability the burners leave nothing to be desired—of course, taking price into consideration. When they are tried, satisfactory results are anticipated. All the burners received may be best described by saying that they are after the "C" Welsbach pattern; and, mentioning them in the order in which they were brought to notice, we have first to refer to those of Messrs. Falk, Stadelmann, and Co. The series of burners to which they specially direct attention are in their finish excellent. They are highly polished and lacquered, have steatite insulation, and are of good weight and strength—in fact, it may confidently be said they will not disgrace the best-class fittings. There is no comparison between them and the cheap and flimsy counterfeits which we have already condemned; and yet their prices are not prohibitive. It is perhaps as well to distinguish them by the firm's own numbers—viz., G 6734, G 6736, and G 6738. The first is a plain burner; and, deducting the trade discount, the price it is found works out to 1s. apiece. The second, which is a more imposing looking burner, with a strong bye-pass, costs 2s. 3d.; and it has a fellow, with bye-pass, lever, and chains, which is priced at 2s. 4½d. There is no question as to the superior appearance of these burners; and in this respect they will vie with some of the dearer goods on the market. The firm are making preparations to supply these burners in large quantities almost immediately. They are also supplying different types of burner at from 3s. 3d. a dozen; but those to which reference has been made are the ones which they have specially recommended to the notice of gas suppliers.

Then we come to the goods of the Wholesale Fittings Company; and they have laid before us for examination a whole range of their burners, some of which possess novelties in their construction, and others (and with these we are most concerned at present) which are marvels in point of price. The costs run, according to the quantities taken, from 2s. 9d. to 18s. a dozen. But we will discard the cheaper types of burners in this notice, as we do not think they are, from the point of view of appearance alone, exactly what gas managers require. We prefer to start with the Company's burner (known as 52ss), which is priced at 7s. 6d. per dozen. This is an example of an article which, we should imagine, would be of a character suitable for some of the work contemplated by gas suppliers. Another burner which takes our fancy in the same series, and is designated 59ss, is being sold at 17s. a dozen. This is a bye-pass burner; and there is another of similar construction, but with lever and chains, for which only an additional 1s. a dozen is charged. The Company call attention to the improvement in the construction of the heads of these burners; and they state that they are arranging to fit them in the future with pure nickel gauze. Although extremely cheap, the burners, it must be said, are well turned out. They have a clean finish, and are of a weight which denotes strength. It is really a matter for surprise how they are profitably produced at the price. The information given about these burners and others the Company have on sale would need for its full treatment a long article; but, as in the case of the other firms named in this notice, gas managers will do well to purchase sample sets, and examine them on their own account.

Although not specially bearing upon the subject of this article, it may be mentioned that, among the burners shown, was seen a novelty in the shape of an anti-vibrator burner. It is made with two bunsen tubes—one fitted inside the other. Surrounding the outer one is a spiral spring, upon which rests the head of the burner. The inside tube prevents the burner getting out of the perpendicular. The body of the anti-vibrator is fixed upon a table, and one of the bunsen tubes is attached to a support moving on ball bearings. This is also a cheap burner. The "Bonbac" is a high-class article, and is attributed with a splendid duty per cubic foot of gas consumed. The stem is of conical shape; and inside this is a "mixer," which is something in the shape of a grooved helmet spike, and is inverted, so that the apex points to the current of gas. Another novelty is a burner which needs no gas tap or cock. By giving the burner itself a part turn a full supply of gas is obtained; and naturally the slighter the turn the smaller the flow of gas—in fact, the passage of gas can be restricted to such a point as to form a bye-pass jet. We cannot here deal further with the numerous burners shown to us by the Wholesale Fittings Company; but that they meet all the requirements for cheapness and respectability, is proved to our satisfaction.

The third firm who answered our question with samples of burners and prices were, as stated, Messrs. J. & W. B. Smith. These, too, are splendid examples of workmanship; and one can only wonder how it is accomplished at the price. Burners at 6s. 9d. per dozen have an excellent cut and finish about them; and in this respect their introduction to consumers will not cause shame to any gas manager. A bye-pass burner of more striking appearance, and of good solid construction, figures out at only 15s. a dozen.

Now in calling attention to these burners, we have refrained from making comparisons between them, nor have we said anything as to their efficiency—for the simple reason that it is always preferable in these matters to make a fair test before committing oneself to a definite statement. But here we have conclusive proof that burners of respectable appearance can be produced and sold at a profit as low as a fraction over 6d.; and really high-class burners can be had at something below 2s. 6d.—with excellent classes of articles at intermediate prices. This being so, gas officials should be urged by managers to do all in their power to dissuade consumers from purchasing for a penny or two less than the minimum price here mentioned, worthless or paltry looking burners, which, experience makes it safe to say, may cause them to execrate the day on which they adopted incandescent lighting, or which may produce a dissatisfaction that will not be easily vanquished. This kind of thing is not to the interest of the gas supplier. Altogether, we venture to think the paragraph published last week has accomplished a service to both sellers and those who desire to buy "cheap and respectable" incandescent burners. There may be many other firms who have burners which are of equal merit to those specially mentioned in this article; but if they do not choose to bring them prominently before the gas world, and lose trade in consequence, that is their affair, not ours.

COUNTY COUNCILS AND THE PROMOTION OF BILLS.

Most of our readers are aware that, under the provisions of the Local Government Act of 1888, County Councils have power to oppose Bills in Parliament; but as the law at present stands, they cannot, with the exception of the London County Council, promote them.

This disability it is proposed to remove by a Bill introduced on Monday last week by the President of the Local Government Board (Mr. Walter Long), by which he will also amend the Borough Funds Act, 1872. The first clause of the Bill provides for the extension of the powers of the Act of 1888 to the promotion of Bills; and the county council may determine whether any expenses incurred are to be regarded as being for general or special county purposes. Such determination is to be subject to appeal, at the instance of the Overseers of any parish affected, to the Local Government Board, whose decision is to be final. This extension of power will necessitate an amendment of the Borough Funds Act, 1872; and the greater portion of the Bill is devoted to this object. No expense in relation to the promotion of a Bill is to be charged unless the requirements as to polling set out in the first schedule have been observed. These specify that notice is to be given by placards and by advertisement in some local newspaper circulating in the borough or district on one day in two successive weeks, stating the title of the Bill, the date on which it was first deposited, the time and place where it may be inspected and purchased, and announcing that a public meeting of electors will be held, not less than twenty-one days after the first advertisement, for the purpose of considering it. When the meeting is held, unless a poll is demanded with respect to any resolution, the decision, as declared by the President, is to be final. A poll may, however, be required by not less than 100, or one-twentieth in number, of the electors, whichever may be the less; and the request for it must be lodged within ten days of the meeting or any adjournment thereof.

If the result of the poll or the decision of the meeting is against the promotion of the Bill, or any part thereof, the Council are forthwith to take all necessary steps to withdraw it or the portions objected to. In the case of equality of votes on any question of promotion, the result is to be deemed a decision against such promotion. Where the whole or parts of a Bill is or are withdrawn, no further expense is to be incurred; but any outlay incidental to the preparation and promotion of the Bill up to its deposit and withdrawal (if withdrawn), and the taking of a poll, shall, when allowed under the Borough Funds Act, be payable out of such of the public funds or rates under the control of the Council as they may determine. Nothing in the Bill is to alter or affect any special provision in a Local Act for the payment of the costs and expenses incurred in connection with the promotion of a Bill in Parliament, or take away or diminish any rights now possessed by a Council, who are to be at liberty to adopt the new procedure provided by the Bill in lieu of that specified in the Local Act. Offences in relation to polls are to be subject to a fine not exceeding £20. Failure to comply with the requirements of the Bill is not to render invalid the charging, under the Borough Funds Act or the Bill now introduced, of any expenses in relation to the promotion of a Bill, if such failure has not affected the result of the proceedings under the Bill. The provision contained in section 4 of the Borough Funds Act, that no expense in opposing a Bill in Parliament is to be charged unless the opposition has had the consent of the owners and ratepayers of the district, is to cease to apply. The Bill, if passed, is not to extend to Scotland or Ireland.

The late Mr. J. F. Taylor, who was for a long period Chairman of both the York Gaslight Company and the York Water Company, has left estate of the value of £54,092.

THE BOARD OF TRADE ANNUAL ABSTRACT OF TRADE AND LABOUR STATISTICS.

We have received from the Labour Department of the Board of Trade a copy of the eighth annual abstract of labour statistics for the United Kingdom. In regard to many annual publications issued by Government offices, we have frequently commented upon the length of time occupied in their compilation—the figures relating to one year often not appearing until another has drawn towards its close. The report before us has been published much more expeditiously than are many of its kind; but we cannot say that that fact reflects a wonderful deal of credit upon its compilers, seeing that the feat has been accomplished only by issuing the report with many sections of the statistics a year behindhand—that is, ending at 1900 instead of 1901. It would have been better to have waited so as to make the abstract a complete one. The figures relating to iron and steel, for instance, obtained from the British Iron Trade Association's annual statistical statement, could have been included had the report been kept back a very short time, and such statistics are of first importance among those relating to the course of trade in this country. In the completed sections of the abstract, however, many interesting particulars are to be found.

Two points especially strike one in examining the various tables that throw light upon the industrial situation in 1901. One is that, tested in almost any way, the general volume of business is seen to have contracted last year in comparison with the preceding "fat years." The other is the remarkable maintenance of activity at record level of one particular branch of industry—namely, that of shipbuilding—without which the decline in business generally would have been much more pronounced than it actually was. The extremely good business done by shipping companies in the years preceding 1901 evidently led to an extraordinary amount of capital being brought forward for investment in new ships, in spite of the fact that a severe fall in freights had taken place, and that the rates current were so low that ships were being laid up by the score in the Tyne and elsewhere rather than be sent to sea to lose money. The result was that the tonnage launched in 1901 was greater than ever, surpassing the enormous figures of 1899 and 1900. The statistics of the output of the shipbuilding yards for the past sixteen years are, indeed, of great interest, showing as they do the enormous fluctuations that take place in that industry—fluctuations having great effect upon the labour, coal, iron, and steel markets throughout the country.

In the past four years, the activity in the shipbuilding yards has undoubtedly assisted materially in keeping trade "humming" while the "boom" was running its course, and in breaking the fall when it came. During that period, the output of ships, for the merchant service and the Navy alike, was far above all previous records, as the following figures show:—

Shipbuilding—Tonnage Launched.

Period.	Merchant Service.	Navy.	Total
1886—1889	2,137,402	189,925	2,327,327
1890—1893	3,008,353	349,403	3,357,756
1894—1897	2,698,637	355,049	3,053,686
1898—1901	3,747,018	512,769	4,259,787

Now the supplying of, on the average, an additional 300,000 tons per annum of material for shipbuilding, and the employment of the labour for turning that material into ships, have an appreciable effect upon business in all directions; and we have set out the above figures, and called special attention to them because there is good reason to anticipate that in the next two or three years the output of ships will fall off very considerably—up to the present, orders on hand have kept the yards well occupied, but the orders are not being fully replaced as they are executed—and thus tend to some easing-down in the coal and iron markets, which are already much softer than a year or two ago. The four years 1889 to 1892 witnessed a similar, though not quite so great an, activity; the output aggregating 3,641,000 tons, or 910,000 tons per annum on the average. But in 1893 the output was down to 621,000 tons. There is every likelihood of history repeating itself at an interval of ten years. Those who require to keep themselves well informed as to the probable trend of the iron and coal markets (as do gas managers very especially) will do well at all times to watch the course of events in the shipbuilding yards. The latest report from Glasgow is: "No important orders have been received; but the berths on the Clyde are fairly well occupied, and the work on hand will ensure steady employment for at least the remainder of the year."

We have said that practically all the groups of statistics—apart from those relating to shipbuilding—give evidence of the slowing-down of trade. The first that may be mentioned are the figures relating to the number of unemployed members of Trade Unions. These show a higher percentage than for any year since 1895, though the upward movement of the curve has been gradual and the percentage for 1901 is not large compared with some of the "lean" years that preceded the revival in trade. The highest mean percentage of unemployed members in the past ten years was in 1893, when it rose to 7·5, from which figure it fell—gradually at first and then more quickly—to 2·4 in 1899. Last year the average was 3·8 per cent., ending in the highest figure of 4·6 per cent. When the reservists are all home from South Africa, and the shipbuilding yards begin paying-off on a large scale, the unemployed figure will go up with a run, and the labour market will be easier than it has been for some years. Unfortunately, the gas industry, which has had to pay pretty stiffly increased wages bills, in consequence of the small margin of unemployed labour during the past three or four years, will probably not obtain much relief when that margin becomes a considerable one.

The labour market has been very decidedly affected by the rapid increase in the number of men employed in the coal mines during recent years; for that number rose from 707,000 in 1898 to 729,000 in 1899, to 780,000 in 1900, and to no less than 807,000 in 1901—an increase of 100,000 men in the three years. With wages falling materially, and employment becoming less regular in the mines (the average number of days worked per week by coal mines last year was the lowest since 1896), a good number of the men who were attracted to the coal mines by the exceptionally heavy wages to be earned will find their way back to other spheres of industry, and assist in bringing the problem of "the unemployed" once more into prominence. The days worked per week in the iron mines were likewise lower than in any of the five preceding years, and the average number of shifts worked in the various iron and steel works fell below the records for the years the "boom" was in full swing—1899 showing the highest figure of all.

Accompanying the slackening of trade and of employment, is found, naturally, a fall in wages—the first fall since 1895. In the five years 1896-1900, the reported increases in wages amounted to £439,200 per week—that is to say, at the end of 1900 the working classes were in receipt of wages at rates equal to some £22,800,000 per annum more than at the end of 1895. In 1901 net decreases amounting to £78,500 were reported, or nearly the average increase in the preceding five years. The current year will doubtless see a further material drop; both increases and decreases having taken place mainly in the coal and iron trades. Reductions in hours of labour in 1901 were both less in the aggregate and in the average per head of those affected; only 24,000 persons having their hours reduced by an average of two hours. It is worth noting that the reductions in hours of labour granted during the past eight years represent the working hours of over 25,000 men working 48 hours per week. In other words, unless the reduction in hours has been followed by an increase in the hourly output of the employees—which is by no means always the case in practice, though it is in theory—25,000 more hands are now required to do the same amount of work as was done by the lesser number of hands eight years ago. This spells increased cost of production. The time lost through trade disputes in 1901 was 50 per cent. greater than in 1899, and represented the time of 13,000 men working 300 days per annum—a loss of (say) £1,000,000 in wages alone. And 1901 was not a year of serious strikes! Nearly half the total was due to disputes in coal-mines, which are perfect hot-beds for growing labour troubles.

The statistics relating to Trades Unions, profit-sharing, co-operative and friendly societies, and other subjects, being a year behindhand, do not call for any notice here; and we will conclude as we began, by saying that an annual abstract, to be of first importance and real value as a work of reference, should be brought up to date in all the branches of statistics with which it proposes to deal, and should not be issued until it is.

M. LENCAUCHEZ ON THE INDUSTRIAL USES OF COKE.

The feeling that the present is a critical period for the trade in gas-works residuals, which has found expression in our editorial columns, is not confined to this country. On the contrary, it is experienced with equal force in France, and to a less extent in Germany, where the chief demand for gas coke is for the universal domestic close stoves and cooking ranges. Hitherto, the consumption of gas on the Continent has been so small, comparatively to its use in the United Kingdom, that the output of the residual coke has not been embarrassing to the manufacturer. Added to this, the price of fuel suitable for domestic uses has been so high in the countries in question, that the local markets for coke have been very favourable to makers. Signs have made their appearance, however, which indicate that this state of things cannot be depended upon to endure. So far as Germany is concerned, the rapid increase of gas consumption in the large towns, due to the popularity of cheap incandescent gas-burners, has already brought large and unsaleable coke heaps within the horizon of the gas managers; and they have accordingly turned their attention to the possibility of modifying their carbonizing methods so as to make coke which shall command a sale for metallurgical purposes—as an "oven" coke, in fact.

It remains to be seen what measure of success will reward these efforts on the part of German gas managers to meet a state of things which is for the time being peculiar to their own circumstances. The nature of these should never be lost sight of by English gas manufacturers, who have learnt (and with justice) to

regard German technical practice as replete with instruction for themselves. Several strong inducements have operated during the past few years to make German gas manufacturers rely more than formerly upon the native coal as their main raw material. This coal is of a poor nature, and much of it will not coke well without the help of more pressure during the process than it gets in ordinary gas-retorts. Hence, while the cheapest and most plentiful Continental coals will yield the low-grade gas which is all the gas manufacturer requires in his novel circumstances, he has found himself in danger of losing his coke trade altogether, unless the quality of this fuel could be improved. This is, briefly, the chief reason for the attention actually being given in Germany to methods of coal carbonization "in bulk;" but from what has been said, it will be seen not to follow that the expedient is worth copying where the conditions are different.

In France, the conditions are not quite the same as in Germany, although the tendency is in the same direction. There has not been here the same extraordinary industrial development of late years, nor such occasion for a sweeping alteration of the technics of gas manufacture. The application of incandescent gas lighting has been far more restricted; and the obligations under which gas manufacture is carried on have not been generally relaxed. Still, the questions of what is and what can be done with gas coke have acquired a gravity not attaching to them in the past; and there has arisen a new source of anxiety for producers of this commodity, which lies in the extreme avidity with which power users are taking to producer gas in place of steam. The poorest, driest native coals are quite available for use in the multitudinous patterns of "gazogènes" put upon the French market in connection with gas-engines; and this notable industrial change has been brought about quite independently of the home gas industry, either as regards gas or coke.

In these circumstances, special interest attaches to the exhaustive paper on the industrial uses of coke contributed by M. Alexandre Lencauchez at the last meeting of the French Gas Engineers' Society, as already mentioned in the "JOURNAL." The author's name is distinguished in connection with the improvement and popularization of the gas producer and engine as an economical combination for the generation of motive power; and he looks at his chosen subject from his own standpoint. He only incidentally glances at the domestic uses of coke, which are outside his province; but he mentions them in an instructive way, illustrating the thoroughness with which it has long been customary in France to prepare this fuel for the market. There is no sale for coke as it comes from the retorts. It has always to be broken and screened to different sizes, of which the biggest is lumps of about 2½ inches, and the smallest is mere dust. The last finds a use in stoves of the Michel Perret slow combustion type, and also for multitubular boilers, in both cases with good economical results. The larger sizes of clean coke still find a good market for the Paris Metropolitan Railway locomotives, which are not permitted to burn the dirty coal so familiar to travellers on other French railways. M. Lencauchez shows how, in order to burn breeze and coke dust properly, it is necessary to substitute perforated plates or hot-air furnaces with double vaulting for the ordinary fire-grate, and to have recourse to assisted draught when great heat is required. For domestic use, with such fuels, the "Salamandre" type of stove is recommended. These are really gas-furnaces; but the carbon monoxide is burnt on top of the fuel bed.

For steam raising with lump coke in ordinary boiler furnaces, it appears that this is really a better fuel as sold by the Paris Gas Company, than the common Pas-de-Calais coal. The superiority is as much as 13 per cent. At the Say sugar refinery, Paris, where the consumption of steam fuel is 200 tons per day, it is the practice to mix from 45 to 60 per cent. of coke breeze and dust with the more or less coking coal. The firing is rather slow; but, in the result, the coke dust does as much work as the coal with which it is associated. French blast-furnaces commonly use varying proportions of gas coke, according to the relative prices, with the oven coke. The Marseilles Gas Company actually own blast-furnaces which have always taken from 45 to 60 per cent. of their coke output, ever since the establishment of the concern. It is admitted in France, as in England, that the best fuel for portland cement kilns of the old type is gas coke.

Gas generator furnaces, burning coke, are employed by French glass makers, sugar refiners, and manufacturing chemists. It makes too dry a gas for iron and steel melting, unless steam is added, which yields a semi-water gas. The author gives drawings of these furnaces, which are simple detached producers. When sufficient steam is added, by an injector and from a wet ash-pan, to show regularly 10 or 11 per cent. of hydrogen in the producer gas, it is considered that the mixture is sufficiently reducing in character, while the producer will work with less trouble from clinker. M. Lencauchez demonstrates that there is no great advantage in what he calls this "mixed" gas over the "dry" gas, such as that of blast-furnaces, provided that the employment is immediate, without loss of sensible heat—as in the case of gas-retort furnaces. It must not be forgotten, however, that the richer the gas, the more secondary air it requires to completely burn it; and inasmuch as it is on the secondary air that the benefit of regeneration is carried into the furnace, the economy of regeneration is proportional to the richness of the gas. Where the gas is to be used at a distance from the producer, after cooling and perhaps purifying, the "mixed" product is better. On the other hand, the production of "mixed" gas goes with such a cooling of the fuel in the producer as to prevent the formation of clinker, which means that perhaps a very cheap but cindery coal cannot be used at all. Many inventors—notably Minary and Didier—have vainly tried to cause the clinker of a gas-producer to run out in the fluid state, like the slag of the blast-furnace; but success has not been achieved, and cannot under the conditions be reasonably expected. Too high a heat would be required for this object. It is preferable to work the producer so that it can be clinkered in the ordinary way. M. Lencauchez speaks of gasifying breeze containing from 30 to 40 per cent. of ash, which necessitated the duplication of the producing element in order to keep up the yield of gas and permit of the clinkering of one at a time while all the air blast was passed through the other. In this way, thanks to the employment of a proper quantity of steam, 20 minutes' clinkering every three hours sufficed to keep the producers in proper order. After clinkering and making up, the first 5 minutes' gas was blown away.

M. Lencauchez speaks well of the gas-producer with water sealed ash-pan, as principally used in England and Scotland—the improved Wilson type. He goes on to describe a type of producer, presumably of his own devising, which is supplied with a blast of a mixture of air and superheated steam at a temperature of 250° and even 275° C. This arrangement consists essentially of a Field tubular boiler placed over the generator, and a Cowper hot-blast. It is claimed that the gas can be improved 30 per cent. in richness—*i.e.*, in hydrogen content—by virtue of supplying the blast of air and vapour at the temperature above given. Experience and calculation show that if the primary air mixed with steam is introduced into a gas-producer, this brings 450 calories to help the gasification of the solid carbon, and thus increases by one-fifth the quantity of water gas produced by the apparatus while working continuously. With a good apparatus of the kind, a mixed gas can be made containing 53·52 per cent. of combustible, of which 31·75 per cent. is hydrogen, and 21·53 per cent. carbonic oxide. The calorific power of such a gas is 1505 calories per cubic metre.

Any gas made from coke for motive power purposes is required to be washed free from dust and purified. The best washer known is a double fan, with equal and opposite vanes; the gas being damped with about twice its weight of water. The dust is thus thrown out by the centrifugal action, and runs off as a milky slush. Coke gas is much more laden with dust than gas managers would generally believe; and this dust is extremely difficult to get rid of. Coke-scrubbers are useless for the purpose. The arrangement is recommended for trial in gas-works, to dry and deprive the crude gas of tar, for which purpose it is stated to be far more efficacious than all known washers and scrubbers. Be this as it may, it cannot be gainsaid that the paper of M. Lencauchez is a very clever production, worthy of being regarded as the last word for the present of that practical French science which has done so much for the native power user, handicapped as he was with the dearness and badness of the coal supply of the country.

ELECTRIC LIGHTING MEMORANDA.

Electrical Opinion of the Bermondsey Precedent—The Local Authorities' Disillusionment—The Rule of Profitable Trading—The Sad Example of Stepney.

THE "Electrical Review" has been the first organ of the electrical interests to notice the check to municipal trading at the expense of the ratepayers administered by Parliament in the Bermondsey case. Our contemporary this week has an article discussing the Board of Trade return relating to the year's proceedings under the Electric Lighting Acts, in the course of which it notices the slacking off of local authorities in the chase for Provisional Orders. This is attributed to the discovery made by such bodies, and especially by the ratepayers, that electricity supply is a business which is not quite so profitable as was at one time imagined. The difficulties of building up such a business—involving a change of habits, and considerable expense to the consumers—are allowed to be showing up more distinctly as the annual returns come to be analyzed. A local authority is credited with feeling these difficulties more than a company, being "hampered in many ways in having to borrow and repay the necessary capital, restricted in such matters as the wiring and fitting of consumers' premises upon hiring terms, and unfitted for pushing a business it does not understand. Ratepayers are getting shy of speculation at their risk, and are becoming more pronounced in their opposition to the raising of loans for such a purpose." So it has come to this confession at last!

Almost every one of these explanations or excuses of the failure of local authorities to make a good thing out of the supply of electricity might be traversed by reference to claims advanced in the past for the "principle" of municipal trading in this commodity. The raising of the necessary capital, now admitted to be burdensome, was always alleged to be one of the chief points of advantage held by a local authority over a company. The local

authority was supposed to be in the best possible position for creating a business at once, as it had not to wait to prove its worthiness of public support. It had also the imaginary advantage of being able to start with the lighting of the streets and the public buildings as a paying nucleus of a connection; and nobody ever before suspected a municipality of inability to push trade, or to secure for itself any operative advantage. The truth of experience is, however, that there is "no money" in most municipal electric lighting. "The annual accounts of the electric lighting committees, when investigated by competent and independent experts, warrant the suspicion of the ratepayers that little reduction of their burdens will come from trading in electricity, and some of the councils are transferring their Provisional Orders to private companies competent to organize and carry on the business properly." The howl of Progressive deprecation may be heard, by anticipation, with regard to this confession; but it is of course only a confirmation of what has been maintained here for years.

Yet oddly, enough, our contemporary seems to object to the Bermondsey precedent, the importance of which it owns, on the ground that it is a "practically unworkable condition" to insist that the price charged to the consumer shall be such as to prevent loss to the ratepayers. "This places the local authority on the horns of a dilemma," we are told; "for if they charge too high they will not get customers, and unless they do they cannot earn working cost, interest, sinking fund, and depreciation." The consequence here formulated does not follow; for there is an obvious third course—that is, to have the command of a sufficient volume of trade to enable business to be done at a reasonable price without loss. This is the way most commercial undertakings live; but it is certainly not the way of municipal trading concerns. Unless they are prepared for this test of answering to a public need, what is their justification for existence at all?

A notable example of what follows neglect of such a requirement is the Stepney borough undertaking, the state of which is fully revealed in a special report from a local source reproduced in another column. As usual, the Stepney authorities have been very shy of publishing their electric lighting accounts. But these have at last appeared; and a saddening reflection on municipal wisdom is all they offer. As usual, also, the capital expenditure doubled itself very early in the day. An heroic stroke was put in, for the imagined benefit of the young undertaking, by doing away with much gas lighting of street-lamps in favour of the municipal electricity. The saving of £1200 in gas was replaced by an extra expenditure of £1500 on the old public lighting charges. This was at one end of the scale of operations. At the other end, the electricity generating station was supplied with heat from the dust destruction plant at a nominal charge. The Works Committee, however, no longer see why they should bear the brunt of the ratepayers' contumely, as a spending department; and accordingly they propose to increase their charge for steam from £1085 to £3000 a year, which will leave the Electricity Committee with a deficit. It does not really matter to the ratepayer whether he pays through one corporation department or the other; but it is a point of importance for the members of the various committees concerned. In yet another way is the municipal trade in electricity indirectly aided. Somebody does the distribution for it without charge; for the whole expense of distributing Stepney electricity for a year was £6 14s. 4d. Who shall say, after this, that the Bermondsey rule was enacted a day too soon? Such municipal trading as that of Stepney is a sorry farce.

A FAVOURABLE VIEW OF ELECTRIC LIGHTING.

A very well-informed article on "How to Instal your Electric Light" is to be found where, perhaps, one would least expect to find it—namely, in the "Church Family Newspaper." It may be taken for granted that the "eminent electrical expert" whose opinions are quoted on the subject has said all that fairly can be said in favour of the light which it is proposed to instal; and yet there are a good many points in the article which should give pause to the plain man who is not overburdened with this world's goods. The first advice of the expert is to employ a consulting engineer of good repute, who will see that the installation is carried out in a proper manner. This is no doubt very nice from the point of view of the consulting electrical engineer, and we would not for a moment dispute the fact that the advice is perfectly sound. But somehow it does not convey an idea of cheapness, in spite of the assertion that in the end it saves money. If this method is not adopted, the work may be badly done, and then, as anyone who has followed the question at all will be quite well aware, there is grave danger from fire. In any event, the Insurance Company will have to be approached on the matter; and some of these companies are not at all easy to satisfy. It is therefore well to get a clause inserted in the specification for the work agreeing to meet the requirements of the office in which the would-be consumer may be insured.

We all know—or, at least, we have been assured that it is a fact—that electricity is the "poor man's light." But we can imagine the "poor man" at this stage putting his hand into his pocket and wondering whether, after he has paid all expenses incidental to the installation, he will have any money left for current. That this is no exaggerated view of the matter, will be understood from the expert's assurance that "one can pay anything from £1 up to £5 a point, according to the excellence of the work and the strength of the current," for wiring a house. The advice which follows is touching in its simplicity: "Avoid cheapness in the outset. Have everything well wired and well fitted; and then try and economize all you can." If the installation costs anything like the higher of the two figures mentioned, the need for economy after the bill is paid will be pressing. One method of effecting this very desirable object is said to be by having single lights rather than groups; but it seems probable that it would take a long time for the saving secured by this master-stroke of ingenuity to wipe off the "£1 up to £5 a point."

The expert, of course (as what electrical expert does not?), scouts the idea that electricity is necessarily any dearer than gas. He urges that, "you can control the expenditure to any degree you please—so much so that, allowing for the saving of furniture and decorations from cleanliness, it need not cost you in the end any more than gas; and you have the comfort of the thing and the benefit to health into the bargain." We would, with all due deference to the eminent electrical expert, venture to point out that this has not been the experience of electric light users in Sheffield and many other places that could be named. But the other points with regard to the subject are so fairly and ably set forth in the article, that we may perhaps leave this matter to the consumers to settle for themselves. One thing more, however, is made clear for the benefit of the readers of the "Church Family Newspaper." It is admitted by the expert that electric lights fixed into ceilings have a tendency to dirty them; and this, he says, is caused by the piercing of the ceiling, and cannot be avoided. The perforation, however carefully it may be done, has the effect of sucking up the air, and with it particles of dust, which adhere to the opening. Thus electricity, at least under some conditions, it seems, may indirectly cause that discoloration of ceilings which is so continually urged as a serious drawback to the use of gas.

THE GAS AND WATER STOCK MARKET.

(For Stock and Share List, see p. 225.)

The Stock Exchange has had a less troublous week than that we last had to chronicle; but still it was not to be expected that things would come quite right all at once. Much buoyancy was apparent in the American Market; but, on the other hand, the Funds were lower on forced sales, and Public Loans showed symptoms of having been overworked. Railway dividend announcements were disappointing; and the general tendency towards the close was weaker. Final prices show considerable changes in both the upward and the downward direction. The Money Market was rather quiet, and generally steady; and there seems to be nothing in the air to lead to any stress. In the Gas Market, there was a very fair revival of activity, conspicuous after the quiet of the preceding week; and movements in connection with some issues were interesting. In Gaslight and Coke, some inkling of the half-year's result had apparently got abroad; for the ordinary, which had shown signs of weakness towards the close of the previous week, began steadily to decline. Official confirmation was afforded when the Directors announced on Friday that the dividend would have to be reduced from £4 8s. to £4 per cent., together with a reduction of nearly £30,000 in the amount carried forward. This brought the price of the ordinary down from 94¼ to 90. The maximum also shared in the fall to the extent of one point; but the debenture rose to a like extent for some reason. A reduction in dividend paid out of an undertaking tends *per se* to strengthen prior charges; but a reduction in the earning power itself weakens the security. In South Metropolitan, there were very few actual transactions; but the stock had a smart rise in anticipation of the next dividend being at the rate of £5 6s. 8d. per cent.—the full statutory rate, equal to an increase of ⅓ per cent. per annum. Two or three dealings in Commercials were marked at very fair figures. In the Suburban and Provincial group, there were no dealings of note, and the only change was a rise of a point in Crystal Palace debenture. The Continental Companies were more active, especially Union, which showed a firmer tendency; but none of the quotations moved. Among the remoter undertakings, only Buenos Ayres was conspicuous with a fractional advance. The Water Companies continue in a state of suspended animation, anxiously regarding the fierce struggle raging over the Government Bill in the House of Commons, and very little business was done. The only change was an improvement in East London.

The daily operations were: Gas was quiet on Monday, and prices were moderate. Gaslight ordinary fell 1. Tuesday showed an increase in activity, and nothing moved in quotations. On Wednesday, there was more doing, especially in Gaslights, the ordinary falling 1, while the debenture advanced 1. Thursday's transactions were much the same, and again Gaslight ordinary receded 1. Friday was a moderate day, and firm generally. South Metropolitan and Crystal Palace debenture rose 1 each; but Gaslight ordinary fell 1. Saturday was quiet as usual. South Metropolitan gained 2½; but Gaslight maximum relapsed 1. In Water, East London rose 2.

SMALL WATER UNDERTAKINGS.

THE subject of the water supply of villages and rural districts is one which has been discussed from time to time at meetings of sanitarians and municipal engineers, with results which have not, so far as we have been able to see, been productive of the improvement that might have been expected to accrue therefrom. At the Conference on Water Supplies and River Pollution which took place in London last October, Miss Cochrane, a member of the Sanitary Institute, presented a distressing picture of the water supply in a number of villages which had come under her notice, where the conditions were just those which would favour an outbreak of disease. If the rural districts are to continue to supply the life-blood to the towns, it is imperative that they should be provided with good water supplies; and Miss Cochrane suggested that this should be taken in hand by the County Councils, and the working expenses spread over the entire county. That the existing unsatisfactory condition of things requires remedying is apparent; and among those who have studied the question with the view of throwing additional light upon it is Mr. Percy Griffith, M.Inst.C.E., F.G.S., the President for the current year of the Society of Engineers, and the Secretary of the British Association of Water-Works Engineers. As the result of many years' connection with works of water supply in small towns and rural districts, he has been impressed with the number of villages and rural parishes which are at present without any public water supply, and are in consequence very seriously affected; and this led him to undertake a careful study of all the difficulties attending the carrying out of water-works in such districts. He found that they arose mainly from the parliamentary and legal status of the various public bodies interested; and to this side of the question he at once turned his attention. The result of his investigations has just been published in a useful little book, which presents, we believe for the first time, a compendium of the law relating to small water undertakings.*

As the first steps taken in connection with any scheme of water supply involve a reference to Acts of Parliament, Mr. Griffith devotes his first chapter to abstracts of those referring to local authorities, and proceeds to consider the limits of powers possessed by these bodies in connection with this important public service. In the next two chapters he deals with the Acts applying to water companies, and reviews the powers of the latter. He thus clears the ground for a consideration of the responsibility for the supply of water, and a discussion of the question of the ownership of water undertakings. This is a very interesting chapter, as we get therein an expression of the author's personal views on the subjects under consideration. One of these is that where the cost of constructing water-works in a poor rural district would involve an overwhelming burden upon the inhabitants, "the larger and wealthier towns and districts in the immediate neighbourhood should be called upon to share the burden, as they now do that of providing the destitute with food and shelter." Municipal ownership was advocated for London by the Duke of Richmond's Commission as long ago as 1869; but it has not come yet, though something approaching it appears to be in sight. Speaking generally, Mr. Griffith considers that, in view of the rivalry now existing, "either company undertakings should be left alone (so long as they are properly managed) and fostered, wherever local authorities are indisposed to carry out necessary works, or else they should be excluded from the field of water-works enterprise altogether." He thinks that while the principle of the control of water undertakings by local authorities is correct, this does not necessarily imply ownership or the construction of works. He is of opinion that small water-works can be more satisfactorily managed by companies than by local authorities as now constituted; but at the same time he regards questions of public water supply as being too vital to the community at large to be left entirely in the hands of trading companies. What, then, is his solution of the difficulty? It is this: The formation of Water Boards, and the gradual transfer to them of all existing undertakings in the hands of companies, "on reasonable terms, and without injustice to the shareholders." The settlement of this question once and for all on some definite lines appears to him, as it does to us, to be essential, in order that proper economy and efficiency in the promotion and management of water-works undertakings may be secured; and his solution of this problem is a perfectly feasible and just one. In his next chapter the author discusses the sufficiency and purity of water supplies and the allocation of sources; and he then deals more fully with the constitution of the proposed Water Boards. We will leave our readers to go direct to him for his views on this matter. There are two appendices to the book—one giving the clauses proposed by the Local Government Board to prevent the pollution of water supplies; and the other furnishing a number of statistics of the working results of various small water undertakings in the hands of companies and local authorities.

Mr. Griffith offers, in his preface, an apology for venturing into the domain of the parliamentary and legal expert. We scarcely think it was necessary. He acknowledges, as everybody does, the great value of "Michael and Will" as a standard work of reference; and he has made frequent allusions to it. But the special merit of Mr. Griffith's book is the colloquial form in which the author conveys to the reader the particulars he has collected from the various Acts of Parliament and the results of his individual experience. We do not know of another in which these questions are dealt with in so readable a manner; and we therefore recommend it to all who are desirous of having at hand a source of information on the legal points relating to the establishment of small water undertakings, prepared by one whose practice has specially qualified him to speak with authority upon them. Reference to the various matters dealt with is facilitated by an index.

* "Water-Works Law as Applied to Small Undertakings." By Percy Griffith, M.Inst.C.E., M.Inst.M.E., &c. London: Biggs and Co.; 1902.

PERSONAL.

It is with keen regret that we learn that Mr. ROBERT BRIDGE, the Engineer and Manager of the Doncaster Gas-Works, is seriously ill, and that the opinion of his medical adviser, who has been in consultation with a specialist upon the case, does not justify the family in entertaining any strong hope of permanent improvement.

The Rev. PAUL W. WYATT, M.A., the Chaplain of the Savoy, who was married last week to Constance, Countess De La Warr, is Chairman of the Bedford Gas Company. As a memento of the event, the Directors presented him with a large silver open-work tray; while the staff gave him a set of gold-mounted turquoise studs and a pin.

We regret to learn that Mr. W. H. T. NORFOLK, the Gas Manager to the Leek Urban District Council, has been incapacitated from holding this position by a thorough breakdown of his health. Some four months ago he had a paralytic stroke, and as soon as he was well enough to be removed, he went away for a change. On his return, he tried to take up his work, but had another seizure, which affected his brain, and necessitated his being placed under restraint. His duties are at present being discharged by Mr. A. Botteley, who, up to a few months since, was Assistant-Manager of the Stoke-upon-Trent Gas-Works.

On Monday afternoon last week, a presentation was made to Mr. W. E. FREE, who has been in the service of the Ipswich Gas Company for many years, on the occasion of his approaching marriage. A substantial tea was provided at the offices of the Company, at which 24 were present; and the gifts—a silver cruet and other articles—were handed to Mr. Free by Mr. J. T. Jolliffe, the Engineer and Secretary, with the congratulations of the staff, and every good wish for his future welfare. Mr. Free, in responding, expressed his sincere thanks to Mr. Jolliffe and the members of the staff for their kindness; and the pleasant proceedings terminated.

Pitch and Coal Tar at La Rochelle.—Pitch and coal tar were imported to La Rochelle from the United Kingdom, and pine pitch from Russia, to the extent of 4972 tons, during 1901. The imports of pitch largely depend upon the demand for patent fuel, of which there is an important factory at La Rochelle, as well as one at La Pallice. A second one at the former place will shortly be established, and a third at Rochefort.

Mr. T. E. Pye on Applied Heat for Trade Purposes and Motive Power.—In the "JOURNAL" a few months ago, we recorded the publication by Mr. T. Ebenezer Pye of a useful little pamphlet containing some interesting comparisons between gas and electricity as illuminating agents. The "Ray of Light" which he then threw upon this subject has, we believe, been productive of much good to the gas industry. But the author recognized that he had only dealt with one side of the question, and he accordingly prepared a companion pamphlet, bearing the appropriate title of "Heat Rays," the object of which was to draw attention to the subjects of applied heat for domestic and trade purposes and for motive power, with special reference to the advantages afforded by the use of coal gas in these connections. The pamphlet is being produced in two editions, an "advance proof" of each of which has been forwarded to us. One contains comparisons with electricity in regard to motive power, cooking, water heating, and gas and electric fires, and includes a chapter on the generation of current from gas-driven dynamos; while the other is meant for use by gas undertakings which are not in competition with electricity, or are in the hands of local authorities owning both gas and electricity works. In each edition Mr. Pye emphasizes the importance of using gaseous fuel in trade processes, and of employing small or large gas-engines in factory and warehouse work; and he gives valuable hints and precautions relative to gas cooking and gas-fires. Many of these are new, and they are all based upon practical experience. The data furnished in regard to electricity appear to us to be very fair towards it. The author has embodied in these pamphlets (which will be serviceable, as their title-page sets forth, in the factory and warehouse, office and home) the fruit of much careful investigation; and we trust that both he and the gas industry will derive considerable benefit from his labours.

NOTES.

Sinking Wells by Freezing.

A long report on recent examples of the employment of the Poetsch freezing method for the sinking of shafts in wet ground has been published in the "Génie Civil." As might be supposed, several minor practical difficulties have been met with in the endeavour to apply the method under different conditions; but it remains the quickest and cheapest means of sinking through water-logged strata. One difficulty is that of keeping the bore-holes vertical; but it only means that holes greatly out of line must be abandoned and filled with concrete, and others made in their stead. At the Auboue iron mine in the valley of the Orne, a new shaft was thus sunk, to a depth of 447 feet, through water-bearing strata which had caused great difficulty with the neighbouring pits. A well was first excavated down to the water-line, and in it the ring of freezing pipes was located. The outer pipes, closed at the bottom, were 4·8 inches outside diameter; and the inner pipes open at the bottom, were 1·3 inches in diameter. The cold was produced by the ammonia process, and the chilled brine was circulated through the ground for 100 days so as to freeze the core of the shaft. Many troubles from broken pipes and rushes of water were experienced; but perseverance successfully coped with them. The frozen soil was blasted out with dynamite; and, as a rule, the walls of the excavation stood perfectly firm and dry while the lining was being put in.

The Use of Benzol as Fuel for Motor-Cars.

Herr Altmann, of Marienfelde, in a lecture before a local Industrial Association, discussed at length the advantages and disadvantages of the commonest and best-tried steam, explosion, and electric motor carriages. For automobile spirit-motors, with the high number of 800 revolutions per minute, he recommended an addition of 20 to 25 per cent. of benzol to the spirit (alcohol). This, it appears, raises the inflammability of the mixture, and promotes combustion. The report of his lecture which we have seen does not show whether he discussed the use of benzol alone or admixed in higher proportions with the spirit. There appears no reason why benzol should not answer as well as, or better than, "petrol" or other petroleum distillates as a fuel for explosion motors. It would be incomparably superior to alcoholic spirit, and would, in this country, be a native product, which "petrol" is not. At its present market price of 8d. to 8½d. per gallon, it could be retailed at as low a figure as "petrol," and would be slightly superior in calorific power and uniformity of composition. An agitation for directing the attention of motor-car users to the advantages of benzol as a fuel would, we think, be more advantageous to our national industries than the somewhat absurd attempts recently made to conciliate agricultural interests by holding out hopes of alcoholic spirit displacing petroleum spirit for driving motor-cars.

The Action of Atmospheric Sulphate of Ammonia upon Stone.

In an article in the "Students' Column" of the "Builder," the destructive action of the atmosphere of modern British towns on the material of buildings is referred to the prejudicial influences of the products of the incomplete combustion of coal. Among other facts, it is stated that house soot always contains sulphate of ammonia, which was long ago shown by Dr. Voelcker to be instrumental in converting limestone into sulphate of lime. Sulphate of lime readily combines with water to form hydrated sulphate of lime, and is apt to cause exfoliation of the stone owing to the expansion which occurs when the sulphate of lime changes from the anhydrous to the hydrated condition. Sulphate of lime is also more soluble in water than carbonate of lime. A notable corroboration of Dr. Voelcker's statement is to be found in the analysis of the incrustation on the Stone Gallery of St. Paul's Cathedral, London, reported to the Chemical Society last year by Mr. E. G. Clayton. The Stone Gallery is situated at the base of the dome, and is constructed of portland stone, which is a carbonate of lime. The balustrade on which the incrustation formed is surmounted by a coping-stone of the same material. There is therefore no sulphate of lime in the neighbourhood of the gallery; yet the analysis showed the incrustation to consist mainly of hydrated sulphate of lime, which can only have been produced as described by Dr. Voelcker.

Gas Coke for Smoke Prevention.

Of all the methods recommended for the suppression of factory smoke in towns, none is more reliable than the employment of gas coke instead of coal. At present, nothing is more economical in Paris, if we may believe a statement made by the manager of a large sewage works situated at the city gates. As given in the "Revue Industrielle," the steam-boilers are heated with coke, at a saving of 3000 frs. per month; and there is no appearance of smoke, though the consumption is 25 metric tons per 24 hours to obtain the steam requisite for working the pumps and treating 600 metric tons of sewage. The coke is delivered broken into small pieces, free from dust, and is supplied from the gas-works at the rate of 14 frs. per metric ton. To deal with the same quantity of material, 20 tons of coal, costing 25 frs. 50 c. per ton, were consumed daily. Thus the saving is roughly 160 frs., from which the cost of cartage has to be deducted—viz., a maximum of 50 frs. No change was necessary in the boiler grates; but care had to be taken to convey a stream of moist air under them, which was done by conveying the steam from the saturation tanks into the fireplaces. Some inconvenience attends the employment of small coke, as it usually contains stones, which cause slight explosions, though they are harmless when the door of the furnace is shut; there is also a production of clinkers to a considerable extent. Coal, badly sorted as it is now, gives rise to similar inconveniences, causing an expense of 5 to 6 frs. more per ton. This instance of the suppression of the smoke nuisance by the use of coke at the Bondy sewage works is of special interest, as several mayors of communes in the vicinity of Paris have issued decrees against factory smoke.

Steam Power for the British Westinghouse Works.

A considerable degree of uncertainty appears to prevail in regard to the part which power gas and gas-engines are to play in the operations of the British Westinghouse Engineering Company, at Trafford Park, Manchester. Everything connected with this enterprise has been so persistently advertised, that the attention of mechanical engineers throughout the country has been engaged in measuring ordinary British practice against what is about to be done at this establishment, whenever it is ready to begin. Among other points, the impression has been distinctly conveyed that Westinghouse gas-engines, supplied with locally made Mond, or a similar gas, would generate the power required for the works. This belief ran through the whole of the speeches made at the recent meeting of the Manchester City Council, when it was decided to offer the Corporation gas at a marked reduction of price for power uses. It has been reported, however, by the local correspondent of the "Engineer," that the electric power now being used about the works is developed by two temporary locomotive boilers through a 250-Watt generating set. A large battery of Babcock and Wilcox boilers, each of 480-horse power, will, it is expected, be ready in about a month or so; and a pair of 1200-horse power Westinghouse vertical Corliss engines are now being assembled on the foundations. All this leaves small room for gas power; so it is to be feared that the future state of the atmosphere of Manchester will not be improved by the completion and setting to work of the Westinghouse factory. The disappearance of gas power from the programme of the establishment calls for some explanation, and certainly does not encourage the hopes that have been entertained locally of the success of other power-gas ventures.

The will of the late Mr. James Shand, who died on the 10th ult., has been proved; the value of the estate being £127,237. Mr. Shand was a Director of the Phœnix Gas Company at the time of the amalgamation with the South Metropolitan Gas Company in 1880.

The publication last week of a scene in the demolition of the Pimlico Gas-Works has brought to our knowledge the interesting fact that the photograph was the work of Mr. Percy F. Coggin, of Carlyle Square, Chelsea, who has been for many years in the Coke Department of the Gaslight and Coke Company.

At a recent meeting of the Société Française de Physique, M. Fouché (whose researches are well known) exhibited an oxy-acetylene blowpipe, in which only pure oxygen and acetylene are used. The proportions in which the gases are employed are 1 volume of acetylene to 1·8 volumes of oxygen. The pressure used is equivalent to that of 4 metres (157·5 inches) of water, and the speed at which the gases issue from the jet is between 300 feet and 450 feet per second. At lower speeds, back-firing is liable to occur. The highest temperature is found in a greenish cone at the centre of the flame; the height of the cone being but ¼ inch. Metals fuse in this with the greatest facility; and it is stated to be easy to form autogenous welds of iron and steel, especially as the flame has neither a carbonizing nor a reducing action. If the quantity of oxogen is reduced, the flame becomes luminous; and if it is then directed on to a fragment of lime, calcium carbide is formed.

Just lately we have noticed several mantles for incandescent gas-lighting in these columns; but among them mention has not been made of the Premier "Bonbac" mantle of the Wholesale Fittings Company, of Commercial Road, E. This is a ramie mantle; and from the tests applied to it, it ranks well in merit. The makers say that, after being burned off, the mantle can be doubled up without fracture; and samples which we have tried prove it to be so. Of course, no one often wants to double up a gas-mantle; but the fact that it can be done with these, shows a fair amount of tenacity. The mantles, indeed, seem to be very flexible and adapt themselves well to the flame. The fabric is composed of ramie; and mantles with a ramie base bid fair to supersede the ordinary cotton ones. The solution is able to more thoroughly impregnate ramie than cotton; and this is one of the reasons for their success. The information is given that the composition of the solution of which this particular mantle is made is a "secret."

TECHNICAL RECORD.

SOCIÉTÉ TECHNIQUE DU GAZ EN FRANCE.

Presidential Address of M. Maurice Piaton.*

Gentlemen,—As I wish to offer the Société Technique de l'Industrie du Gaz en France some proof, however imperfect of my deep gratitude for the very great honour it has done me, through its Council, in selecting me for President, I have collected some data from actual experience, comparing the conditions of working gas and electric light undertakings, both being under the same control. The gas companies which, twenty-two years ago, did me the honour of asking for my assistance in directing their concerns, were among the first, after the Lyons Gas Company, which I regard as a pioneer, to combine gas with electric lighting; and I trust that the examination of some of their results at the end of a period which covers from 1888 to 1902 may be of a kind to interest the members.

It is a corner of the veil that still covers this subject that I wish to lift to-day by means of certain facts. But the question is too big to be able to be explored in all its phases within the restricted limits of the traditional presidential address of a technical society, which should not be more than a mere preface. The topic that I have chosen for this preface is, I believe, still sufficiently current to characterize to some extent the period through which the lighting industry is now passing. How many of our members still find themselves in face of this delicate question: Ought we to remain simply gas engineers, or ought we to do sacrifice to the exacting goddess, Electricity? I do not pretend to give a general solution to the question thus put. I only wish to offer on it a contribution of an experimental kind. We will strictly limit the corner of the subject that we propose to examine by putting the following questions which we will consider in order:

1.—Compare by an average example the capital to be invested per unit of light available by the consumer for gas and for electricity.
2.—Compare the number of units of light per hour, or unit-hours, consumed annually under given conditions of selling price for gas and electricity, worked by the same management; such prices being chosen so as to give an average example for both.
3.—Under the above conditions, compare the net cost of the unit-hour of the two systems, both as regards the total net cost and also split up into its component parts.

As the unit of light, we will choose the carcel, which is the recognized unit for the gas industry in France, and which practically corresponds, all other things being equal, to the average lighting effect of an incandescent lamp of 10 candles. We will take the results which we are going to examine from the accounts of two gas undertakings and of two electricity concerns lighting two French towns of the third class—that is to say, of 70,000 to 100,000 inhabitants each; the economical conditions of which are relatively different, but such that these differences neutralize one another so as to give two fields of illumination as equal as possible. I think that the example of these two towns will give more interesting results at the present time than if these were taken from central steam-driven electric light stations in towns of a lower class than those proposed to be considered. We take two towns in order to have an average of two results, and also, thus, to be able to draw from the inquiry sufficiently general conclusions, having a didactic value. We will call these two towns A and B. In each of them the selling price of gas is about the same; in town B the selling price of electricity is somewhat lower than that obtaining in town A. The prices are averages of the present time, except, however, for the price of electricity in town B, which is a little below. Lastly, in towns A and B, the working of the electricity and of the gas is, or may be considered as being, controlled by the gas company.

1.—*Comparison of the Average Capital Invested per Carcel Available by the Consumer for Gas and Electricity in Towns A and B.*

In each of the two towns the price of gas was reduced some years ago, after an important prolongation of the concession. We will take as the value of the gas-works and the distributing mains in each of the towns the original capital cost unredeemed at the time of the extension of the concession, increased by the capital expenses incurred since the prolongation, and in fact not redeemed. We have:

	Town A.	Town B.
Value of the works and mains . .	2,750,000 frs. (£110,000)	2,350,000 frs. (£94,000)

Each of the two works has a maximum daily output of 20,000 cubic metres (706,000 cubic feet) of gas. For town A we have, therefore, as the net capital cost per cubic metre of daily output—

$$\frac{2,750,000}{20,000} = 137{\cdot}50 \text{ frs. } (£5\ 10s.)$$

By reducing the maximum volume disposable in the proportion of the gas not sold to the gas made in the course of a year, or 19 per cent.—an assumption rather lower than the reality—we have as the capital cost per cubic metre daily available by the consumer—

$$\frac{2,750,000}{20,000 \times \frac{81}{100}} = \frac{2,750,000}{16,200} = 169{\cdot}75 \text{ frs. } (£6\ 15s.\ 10d.)$$

The maximum hourly consumption is one-fourth of 16,200 cubic metres. We have, then, a maximum hourly consumption of 16,200,000 ÷ 4 litres, or 4,050,000 litres. We will accept one of the figures given by our colleague, M. Bouvier, in his very interesting paper presented at the congress of 1900—viz., an average consumption of 50 litres per carcel-hour. This is the figure that allows of the actual power developed by the Auer (Welsbach) burner in town A and also in town B. Therefore we have for the maximum illuminating power available by the consumer in A—

$$\frac{4,050,000}{50} = 81,000 \text{ carcels.}$$

The capital invested per carcel unit at the house of the consumer in town A thus works out to—

$$\frac{2,750,000}{81,000} = 33{\cdot}95 \text{ frs. } (£1\ 7s.\ 2d.)$$

Let us make the same calculation for town B. The net figure for initial expenses per cubic metre of gas per day is—

$$\frac{2,350,000}{20,000} = 117{\cdot}50 \text{ frs. } (£4\ 14s.)$$

Taking, as in A, the coefficient of 16 per cent. for gas unaccounted for, we obtain the net initial cost per cubic metre per day at the house of the consumer—

$$\frac{2,350,000}{20,000 \times \frac{84}{100}} = \frac{2,350,000}{16,800} = 139{\cdot}88 \text{ frs. } (£5\ 11s.\ 11d.)$$

On the same basis as for A, and knowing the maximum hourly consumption is one-fourth of 16,800 metres, we obtain for the maximum hourly consumption—

$$\frac{16,800,000}{4} = 4,200,000 \text{ litres.}$$

Assuming, as before, a mean consumption of 50 litres per carcel-hour, we obtain for the maximum intensity available at the consumer's house in B—

$$\frac{4,200,000}{50} = 84,000 \text{ carcels.}$$

The initial capital expense per carcel available at the consumer's house in B is thus—

$$\frac{2,350,000}{84,000} = 27{\cdot}73 \text{ frs. } (£1\ 2s.\ 2d.)$$

Thus, the initial capital outlay per carcel available to the consumer in a French town of 70,000 to 100,000 population, with gas supplied at an average price and with average consumption, can be put at 30·84 frs. (£1 4s. 8d.). This figure is the mean between 33·95 frs. and 27·73 frs.

Let us now work out the cost of an electric station and mains in each of the towns A and B. It is dependent upon the relations, defined above, between gas and electricity as sources of supply in these towns. As the works and mains have not been subject to amortization, owing to the absence of disposable profits, we can apply to them current figures of initial expense. Thus we have—

	A.	B.
Value of station and cables . .	1,115,000 frs. (£44,600)	1,435,000 frs. (£57,400)

In the town A, the maximum daily output is 400 kilowatts, with a permanent reserve of 100 kilowatts and an accumulator reserve of 75 kilowatts during three hours. When referring to gas, no mention was made of any reserve, as this forms an inconsiderable factor in the initial expenses of a company. The maximum illuminating power available for the customer in A (excluding reserve) is 306 kilowatts; being a yield of 77·6 per cent., compared with 81 per cent. for gas. By "yield," in this connection, is meant the ratio between the disposable energy at the consumer's house and that produced at the works.

In town A the yields for gas and electricity are fairly identical. We have thus a net figure for the initial expense per kilowatt per day at the supply station—

$$\frac{1,115,000}{400} = 2787{\cdot}50 \text{ frs. } (£111\ 10s.),$$

and at the house of the consumer using electric light of—

$$\frac{1,115,000}{306} = 3643 \text{ frs. } (£145\ 14s.\ 5d.)$$

We take the carcel-hour as equal to 10 electric candles, and the electric candle as corresponding to 3·75 watts. The number of carcels available for the customer will thus be 306,000 ÷ 37·5 = 8160 carcels, and the initial cost per available carcel will work out to—

$$\frac{1,115,000}{8160} = 136{\cdot}64 \text{ } (£5\ 9s.\ 4d.).$$

In town B, the maximum power produced is 374 kilowatts in

*A summary of the address was given in the "JOURNAL" for the 24th ult.

place of the 400 kilowatts in A; but there are a number of grouped generators equal altogether to 187 kilowatts, and forming a reserve of 50 per cent. This higher figure for the reserve, compared with that of the supply station in A, is part of the 170 kilowatts chosen in the above instance. There is, moreover, an accumulator reserve of 50 kilowatts for three hours—an amount less than that of the station in A, in consequence of the greater importance of the dynamic reserve.

Calculating on the basis of 374 kilowatts, we get as the net initial expenses per kilowatt at the supply station—

$$\frac{1,435,000}{374} = 3836{\cdot}89 \text{ frs. } (£153 \text{ 9s. } 6\text{d.}),$$

with an efficiency of 60 per cent. only—a very different thing from the 84 per cent. obtained with gas. The net initial expense per kilowatt at the consumer's house is—

$$\frac{1,435,900}{262} = 5477{\cdot}99 \text{ frs. } (£219 \text{ 2s. } 5\text{d.})$$

It may be mentioned here that these are gross results of workings in 1900 and 1901, without isolating them from any particular conditions which could affect, say, the efficiency during the course of the trials. But a corrective coefficient will be introduced into certain of these calculations. Taking the carcel-hour as 10 candles, and the candle as equal to the consumption of 3·75 watts, the number of carcels at the consumer's premises is 262,000 ÷ 3·75 = 6986·66, or 6987 carcels in round numbers; and the initial expenditure per carcel is—

$$\frac{1,435,000}{6987} = 205{\cdot}32 \text{ frs. } (£8 \text{ 4s. } 3\text{d.})$$

We reduce this figure by 20 per cent., since the depreciated condition of part of the works in B justifies us in regarding 50 per cent. of its power as reserve; and we should therefore credit the power of this portion with 50 per cent. of that reserve, as the output of the station in B is slightly superior to that of A. We thus raise by 25 per cent. the power of B, which then becomes practically equal to that of A, while we thereby reduce by 20 per cent. the first expense per carcel at the consumer's in B.

The figure 205·32 frs. thus becomes 164·26 frs., and the mean figure for the initial outlay per carcel at the consumer's is—

$$\frac{136{\cdot}64 + 164{\cdot}26}{2} = 150{\cdot}45 \text{ frs. } (£6 \text{ os. } 4\text{d.})$$

We have seen that with gas the carcel costs 30·84 frs., the ratio of 150·45 frs. to which is as 4·9 : 1. Hence we can formulate the following statement: In French towns of the third order—*i.e.*, with populations ranging from 70,000 to 100,000—paying average prices for gas and electricity, the ratio of the initial expenditure per electric carcel, with a central supply station worked by steam to that of gas is as 4·9 : 1.

II.—*Comparison of the Number of Carcel-Hours of Electricity for Each System of Lighting.*

I now pass to consider the consumption in carcel-hours with each mode of lighting under fixed conditions of sale. The comparison made has no significance unless we add to it the quantities of available carcels and the carcel-hours supplied by the two methods. Contrasting first the available carcels, we have for gas—

$$\frac{84,000 + 81,000}{2} = 82,500 \text{ carcels,}$$

and for electricity—

$$\frac{8160 + 6987 \times 1{\cdot}25}{2} = 8452 \text{ carcels.}$$

The ratio R of these two quantities is 82,500 ÷ 8452 = 9·76. The ratio R^1 of carcel-hours consumed is—

$$\frac{\frac{673,000,000 + 819,000,000}{2}}{\frac{64,000,000 + 80,000,000}{2}} = \frac{747,000,000}{723,000,000} = 10{\cdot}33.$$

This slight advantage in favour of the gas carcel will increase only in proportion as the electric light finds extended use in apartments. If, on the other hand, public lighting remains the sole monopoly of electricity, to the almost entire exclusion of gas, which seems probable under the conditions we have considered, the ratio will tend to favour electricity.

There now remain to be considered the relative selling prices of the two sources of illumination in the two average towns selected as examples. The mean ratio of price per electric carcel-hour to that of the gas carcel-hour is (2·37 + 3·17) ÷ 2 = 2·78. We can thus formulate the general state of affairs as follows: For a French town of the third order—*i.e.*, with a population of from 70,000 to 100,000—where the electric carcel-hour, produced at a steam central station, is supplied at an average price 2·78 times that of the gas carcel-hour, the number of gas carcel-hours sold is 10·33 times that of the electric carcel-hours sold, and the net capital expenditure per electric carcel is 4·9 times that of the gas carcel. To these let it be added that in towns of the kind selected, underground electric mains are usually employed.

III.—*Comparison of the Net Cost per Unit-Hour of the Two Systems.*

We will now summarize the cost of exploitation in the two cases. The net cost of administration in the two towns divide s itself into a number of elements:—

	A.	B.	Mean.
1.—Oil, less value of bye-products	31·40	45·10	38·250
2.—Purification	0·45	0·65	0·550
3.—Hand labour	24·00	14·75	19·375
4.—General charges	16·10	18 50	17·300
5.—Maintenance	14·60	11·70	13·150
6.—Amortization	13·45	9·30	11·375
Total	100·00	100·00	100·000

The last item is calculated on the time during which the towns have enjoyed gas concessions. This time is 42½ years, on an average. With proper maintenance, the above-named amount is ample, especially for concerns in which, at the end of the concession, the works and distributing plant remain in their owners' hands.

For electricity we have adopted an annual redemption rate ot 4·45 per cent. of the first cost, which is the average for the plants here considered, by applying to different portions of the first cost the coefficients admitted by the majority of electric light firms—

	Per Cent.
Land and buildings	2 5
Machinery	5 0
Accumulators	7·0
Plant, tools, &c.	8·0
Underground mains	4·0

The first coefficient is perhaps rather overstated; but the total mean of 4·45, giving a redemption of capital in 22 or 23 years, without mentioning interest, allows a period quite long enough for material of the delicate character of that in question.

The length of concessions granted in respect of electric light schemes is the same as for gas in the two towns under consideration. In A there is no monopoly granted to the electric supply. It is stipulated that the competitors, if any, shall abide by the same rules and regulations as the gas company. In B the electrical concern has a monopoly for about 14½ years. Under these conditions, the figure for redemption in 22 or 23 years is a reasonable one. Taking this rate now, we obtain the following relative values for the factors governing the selling price of electricity, excluding the expenses of management:—

	A.	B.	Mean.
Fuel, lubrication	29·7	31·4	30·55
Hand labour, &c.	17·0	11·6	14·30
General expenses	15·1	18·6	16·85
Maintenance	7·8	6·9	7 35
Amortization	30·4	31·5	30·95
Total	100·0	100·0	100·0

If we take the third column in each table, we obtain the following comparison of the net cost of gas and electricity under these conditions:—

	Gas.	Electricity.
Fuel (and lubricant in the case of electricity)	38·250	30 55
Purification	0·550	—
Hand work	19·375	14·30
General charges	17·300	16·85
Maintenance	13·150	7·35
Amortization	11·375	30·95
Total	100·00	100·00

Hence we see that electric lighting has the advantage over gas as regards (1) cost of fuel, (2) cost of hand labour, and (3) cost of maintenance. The gain as regards the cost of fuel will be increased with the return of fuel to a normal price, and with the use of hydraulic power derived from water at great distances, which may be a more economical source of motive power than steam. The general expenses are practically the same for both modes of lighting; but in the matter of amortization, gas shows a distinct advantage; the percentage on electric light production from a central station worked by steam being almost three times as great as in the case of gas.

I think I can present the first two conclusions as general. As regards the latter, it must be limited to adjacent cases, such as those I have selected. What will be the percentage for redemption in the case of electric light produced by water power electrically transmitted? It is difficult to supply a definite answer, for practical conditions exhibit an infinite variety; but it may be said that this method will be taken up only when it results in distinct economy.

WESTERN (U.S.A.) GAS ASSOCIATION.

(*Concluded from p.* 30.)

Pushing Business in New Orleans.

Mr. Bankson Taylor presented a paper entitled "Experiences in New Orleans," giving some account of the development of the New Orleans Gas Company since it had been taken in hand by the present management. The new arrangements came into force on May 1, 1901; and since that time they had fixed 10,000 stoves, and increased the day output from 60,000 cubic feet to 500,000 cubic feet. They advertised largely in local papers, and the first ten days booked orders for 1200 stoves. The outdoor

staff was raised from 3 up to 250 hands in ten days; and they had to get meters and stoves wherever they could. They had enlarged and entirely re-arranged the offices and office staff, shut up one of the two gas-works, and enlarged the other from a producing power of 750,000 cubic feet to over 3 millions per day. They had put down a 12-mile high-pressure system, and run 1½ miles of 12-inch connecting main to the old works. They sought to secure public favour by liberal contributions to local charities, and by careful courteous attention to all complaints. The system of return post-cards had proved a great success. Looking into the archives of the old Company, he found it was incorporated in 1835, and in 1861 over £11,000 was charged to profit and loss for the liberation of slaves. He recognized Theobald Forstall, Walton Clark, and other well-known names among past officers.

Standard Gasholder Specifications.

In the discussion of Mr. Carpenter's paper on "Gasholder Specifications," * Mr. Shelton thought that the Association might with advantage take action in spreading knowledge of gasholder design, or towards establishing standards of construction. Mr. Egner said that the German Association of Gas and Water Engineers had taken such action two years ago. He instanced an example of the confusion created by tendering for gasholder erection, when each tender represented a different weight of material. He thought contractors would benefit by the establishment of standards as much as the gas companies. Mr. Norris said that when contractors were simply asked to put in a price for a certain size of holder without other conditions, they naturally kept the weight down as much as possible. The modern practice was to increase the supply pressures, and the result was that many gasholders would not give sufficient pressure, except when the outer lift was in action. Therefore, in inviting tenders it was well to specify the pressure required. He instanced a holder that only gave 25-10ths when uncupped, whereas 40-10ths was required; and this necessitated the use of a fan booster. Mr. Goodnow said there was a great difference as regarded sections and weights used by various contractors; and the average gas engineer was scarcely experienced or competent to say which was best. He moved the appointment of a Committee to arrange standard sizes, especially for small or medium holders. Mr. Cowdery seconded; and the motion was carried.

Mr. Carpenter, in replying to the discussion, said that some makers had not mills sufficiently large to secure a uniform quality plate for the sides of steel tanks. Sometimes the weight of the largest plate would run very close to the largest ingot that the mill could cast, and therefore, as he had said, the testing of a sample cut from every plate might be worthless. The question of a few shillings per gallon in the price of the paint used was very trifling. Something was wanted that would not flake off or absorb water. Red lead or anything else worked up in linseed oil would not do, because linseed oil absorbed water. Pure asphalt dissolved in bisulphide of carbon and other carbon paints were better. It would be most desirable if standard sizes of the principal members of gasholders could be defined. The tension on the side sheets was so slight that it was only a question of providing a sufficient thickness of metal to stand wear and tear and corrosion. But in the crown it was a different matter; and in heavy holders the crown plates should be substantially thicker than the sides. As a general rule, the correct thicknesses, &c., would give 3½ inches pressure on the inner lift; but he did not think it was good practice to add superfluous metal merely for the sake of keeping up the pressure. If the pressure was not enough, it could be assisted by a fan, and no more power would be used, because, if the holder was loaded, the exhauster would have to lift it.

Gas-Engines.

Mr. C. H. Nutting, of Chicopee (Mass.), contributed a paper on the above subject. He said that the gas-engine was popular and a complete success as a means of generating electricity. It was economical, and if connected or belted direct to a dynamo, the voltage would not vary 1 per cent. For equal lighting power, the consumption of gas was only one-half the quantity required for direct lighting. Reference was made to the comparative economy of gas and electricity for small motors. While electricity might be cheaper for intermittent working requiring frequent starts and stops, gas had the advantage in the case of steady continuous work. Quoting from some figures published in "Engineering News," giving the cost of a 15-horse power gas-engine run with gas at 4s. 4½d. per 1000 cubic feet, and a 25-horse power electric-motor supplied with electricity at 2·4d. per 1 horse-power-hour, in working tests extending over two months, he showed that gas cost 8d. and electricity 1s. 6d. per hour. In a second instance, a 20-horse power gas-engine, running a carpenter's shop, was used for nine hours per day, and the year's consumption of gas worked out at 1000 cubic feet per day, costing less than the hire of one labourer to turn the grindstone. In a third instance, a manufacturer using a steam-engine at a cost for coal and attendance of £10 per month, exclusive of other incidental expenses, substituted a 13-horse power gas-engine, and obtained similar service from 16,000 cubic feet of gas per month, which cost £3 6s., and also greatly reduced the incidental expenses. In another case, a 5-horse power gas-engine had been running regularly ten hours per day at about the nominal power, without costing anything for repairs; and the consumption of gas averaged 15,000 cubic feet per month. A 3½-horse power engine, running printing machinery for ten hours per day, had only required one set of rings and two ignition tubes in three years; and it averaged 9275 cubic feet of gas per month. A 20-horse power gas-engine used regularly ten hours per day, but not always at full power, had been in operation over a year without costing anything for repair. The consumption averaged 35,000 cubic feet per month. A 2-horse power engine, running regularly at full capacity for ten hours per day, cost £3 6s. 6d. for repairs through running dry on account of neglect, and averaged 6733 cubic feet of gas per month. In his experience, the ignition-tube used about 1000 cubic feet of gas per month. The advantages offered by the gas-engine were becoming more widely known, and therefore its use had largely extended the last five years. Several makers now guaranteed their engines to run on 10,000 B.T.U. per brake-horse-power, which meant about 16 cubic feet of ordinary coal gas. In regard to gas-engines, the best was the cheapest in the end. He fixed separate meters for gas-engines, and found from actual experience that a 1-horse power engine was worth three cookers as regarded consumption of gas, a 5-horse power was equal to 16, and a 20-horse power as good as 37. It was worth while to try and introduce gas-engines.

The Working of Regenerator Benches.

A report on the operation of regenerator benches by Mr. H. L. Doherty contained information similar to that presented by the same gentleman at the recent meeting of the Ohio Association. He enlarged on the importance of keeping an even and uniform thickness of fuel in the generator, and of analyzing the flue gases. The adjustment of dampers, water supply, and the general care and maintenance should be in charge of one person, preferably the retort-house foreman. No one else should be allowed to make alterations; and the responsible party should only do so after proper observation and experiment. With full-depth furnaces, it was necessary to keep down the consumption of water; but with half-depth furnaces, considerable latitude was possible without seriously affecting the results. With this form of setting, he believed in a liberal use of water, and recommended the trial of 1 lb. of water to 5 lbs. of carbon in the fuel. For drawing off samples of hot gases, he used a tube surrounded by a water-jacket, through which a current of water was allowed to flow. He directed attention to the desirability of arriving at standard methods for testing fuel-gas appliances, and also for accurately defining such terms as half-depth furnace, full-depth furnace, regenerator, recuperator, &c.

The Wrinkle Department.

Mr. W. E. Steinwedell, of Belleville (Ills.), the Editor of the "Wrinkle Department," presented a report comprising thirteen items. In connection with the usual steam-jet aspirator used for preventing the freezing of water in gasholder tanks, it was proposed to use an inlet-pipe passing down to the bottom, extending to the centre, and rising to a height of about half the depth of the tank, with the object of drawing water from the "warmest part of the tank." As a means of supplying compressed air for scurfing retorts, a small ¼-horse power alternating electric-motor was used, attached to a No. 2 Buffalo pressure blower. Run at 3000 revolutions per minute, this arrangement gives 170 cubic feet of air per minute, at a pressure of 1½ oz. per square inch, which is conveyed along the top of the retort-stack by a 6-inch sheet-iron pipe, having 4-inch branches over each bed of retorts. The cost of the entire fit-out is under £20; and the consumption of electricity is only about ⅓ unit per hour. As a means of testing coal, a small set, comprising exhauster, condensers, washer, purifier, and meter, of a capacity equal to the make for one ordinary retort, was fitted up in a corner of the retort-house. From the outlet of the meter, the gas can be passed into the foul main or conducted to the testing-room; and this arrangement admits of information being obtained as to yield of gas, coke, tar, and ammonia, together with an analytical and photometrical examination of the gas. In connection with the ordinary water-gas plant, it was recommended to open the blast-valve first, then shut off steam, and lastly open the stack valve, with a few seconds' interval between each, with the object of sweeping out the generator, superheater, and carburetter, and getting all the valuable gas past the seal. An overhead single railway carried on wall brackets, with side tipping cars or baskets that can be pushed by hand, was shown as a convenient means of conveying coal or other solids. An improved diaphragm seal box was described, also a simple arrangement for inlet, outlet, and bye-pass of a station meter, comprising disc valves with side openings.

The Question Box.

In discussing the contents of the Question Box, Mr. Steinwedell thought there was a particular temperature, not too high or too low, at which the Pelouze and Audouin tar-extractor was most effective as regards the prevention of naphthalene deposits. The gas and tar should be sufficiently cooled to allow of the absorption of the excess of naphthalene by the tar, but not so cold as to cause the deposition of other hydrocarbons. Mr. Norris enlarged on the importance of removing the bulk of the tar while the gas was still hot. Mr. Shelton said that, under ordinary circumstances, it was not necessary to insert expansion joints in lines of wrought-iron pipe or make other provision for the effects of variation of temperature.

* See "Journal," Vol. LXXIX., p. 1559.

THE SOCIETY OF ENGINEERS VISIT SOUTHAMPTON.

Southampton, which was only last month the scene of the Gas Institute meeting, was also selected by the Society of Engineers for one of their vacation visits this season. The selection was a wise one; for, in addition to the great natural attractions of the town, there is much to be seen there that is of interest to engineers. Last Wednesday was the day fixed for the visit; and in the morning between thirty and forty members of the Society and friends assembled at the Southampton Railway Station to take part in the very full programme which had been arranged. The party was headed by the President of the Society (Mr. Percy Griffith); and among other well-known faces were to be seen those of Mr. Charles Mason, Mr. G. Maxwell Lawford, and Mr. L. F. Vernon-Harcourt. The weather was glorious; but even the sun's rays, warm as they were, proved to be not warmer than the welcome which was on all hands extended to the visitors. Nothing therefore was wanting to make the outing a success; and a success it was.

Immediately on the arrival of the London contingent, a move was made to the new graving dock which is at present being constructed for the London and South-Western Railway Company by Messrs. John Aird and Co. The Engineer for this work is Mr. W. R. Galbraith; the Resident Engineer being Mr. F. E. Wentworth-Sheilds. The latter gentleman, along with Mr. J. W. Landrey, the representative of the Contractors, conducted the party round, and thoroughly explained everything of interest to them. The dock when finished will be a very large one—indeed, at the time it was commenced it was intended to be the largest in the world, although Liverpool has since "gone one better." The length will be no less than 860 feet, with provision for extension if deemed advisable; and it will be 90 feet wide at the entrance (with the same bottom width inside), and 125 feet wide at the cope level. The whole depth from cope to floor will be 43 feet, giving a depth of water over the keel blocks of from 29½ feet to 33 feet, according to the tides, at high water. It will be built almost entirely of portland cement concrete; and the entrance gates will be of steel, and will be worked by direct-acting hydraulic rams. Two 48-inch centrifugal pumps, capable of emptying the 85,000 tons of water out of the dock in a little over two hours, will be provided; and space will be left for a third pump should the dock at any future time be lengthened. The time chosen for the inspection was most opportune, as the work is just now at a very interesting stage. Passing from the dock, the company were afforded a view of a recently-erected reinforced concrete building, which contains the machinery necessary for the cold-storage accommodation intended to be provided; and they also had an opportunity of seeing men at work on a wall of a similar character. This, however, is not the only purpose for which reinforced concrete is being used at Southampton; for the party were afterwards taken on a steam tug to the Old Extension Quay, which is being widened to permit of deep-water vessels lying alongside. It being advisable if possible (owing to the ravages in Southampton water of the wood shrimp) to dispense with the use of timber for this work, the determination was arrived at to build the platform of ferro-concrete on the Hennebique system; and great interest was exhibited by those present in the driving in of huge piles, 48 feet long and 15 inches square, composed of this material. These piles (which are allowed about a month to set before being driven in) are built up in vertical moulds, in which are placed long steel-rods, which give the required strength. These are laced together with wire; and portland cement concrete of excellent quality is carefully put into the moulds, and rammed round the steel. The process of driving in is very similar to what it would be with a timber pile; but the ram used is exceptionally heavy, being generally 1½ tons. During the operation, the head of the pile is protected by being covered with an iron case filled with sawdust; and besides this a timber dolly is always used. It was, however, found impossible to drive the piles down to the required depth, more especially in the front row, where they had to go 22 feet into the ground through gravel and hard sand; and the water-jet system of sinking was therefore brought into requisition—driving and pumping being simultaneously carried on. The water is fed down a ¾-inch pipe buried in the centre of the pile, and ending in a ⅜-inch nozzle at the point; and the pressure employed is 300 lbs. per square inch. The methods adopted have met with complete success; the piles being driven the necessary depth in less than an hour. When a section of them has been driven in, the concrete round the heads will be stripped off, and the steel rods for the various beams and struts laid in position. Each set of rods will be laced with wire or hoop steel, and surrounded with a timber casing, into which concrete will be poured and rammed; each beam or strut being thus built up *in situ*. On top of all, a flooring of rolled joists and timber decking will be laid. The indebtedness of the party to Messrs. John Aird and Co. was not confined to the permission to visit the works in course of construction, for at the conclusion of the inspection light refreshments were kindly provided by the firm.

After ample justice had been done to these, the second part of the day's programme—a drive to the Southampton Corporation Water-Works at Otterbourne—was undertaken. Unfortunately, Mr. William Matthews, the Water Engineer, was unable to be present, he having been called away by a family bereavement; but the Chairman of the Water Committee (Mr. H. J. Blakeway) welcomed the party at the works, over which they were conducted by the Resident Engineer (Mr. C. J. Haines) and Mr. J. Chalk. Mr. Blakeway explained that other members of the Committee would also doubtless have been present, but for the fact that they were at the time busily engaged in fixing a new rate, to take the place of that which had recently been quashed by the Law Courts.* Southampton, he said, had a reputation for high rating; but even if the town was rated a little higher than perhaps the inhabitants found convenient, at least they had in the water-works something to show for their money. A glance at the works is amply sufficient to explain the pride the Chairman takes in them. Situated right on the railway, with a chalk quarry on the spot to provide material for the water-softening process, and in the midst of beautiful scenery, the lot of those connected with the works must be a happy one. The present works are comparatively new; for it was not until 1884 that the River Itchen (from which the supply was previously taken) was considered an unsatisfactory source, and it was decided to secure a supply from wells sunk in the chalk at Otterbourne. In the following year, an Act of Parliament was obtained; and by the middle of 1888 the original portion of the new works was completed. In 1896, large additions were made; and further extensions are at present in progress. When these are completed, the works will comprise two wells and a shaft 100 feet deep, about 1500 feet of adits, and a pumping-station at a level of 90 feet above Ordnance datum, containing four compound beam pumping engines and three boilers. There are also a softening plant (consisting of lime mills, lime cylinders, lime storage tank, mixer, softening tank, and filters), four limekilns, the quarry fitted with a hydraulic hoist, and waste deposit tanks. The area of land already acquired is 13 acres, to which, however, 35 acres and four houses are about to be added for protective purposes. The quantity of water pumped last year averaged 3¾ million gallons, and often exceeded 4 million gallons, a day; and this, by means of the softening plant referred to, was reduced from 18° of hardness to about 6°. The population supplied numbers 77,000; and over a million gallons per day are used for trade purposes. The capital outlay on the Otterbourne works has so far been £85,000; but to this must be added £12,000 for extensions now in progress.

Afternoon tea was served at the works, by the kindness of Mr. Matthews; and a return was then made to Southampton, where the company dined together at the South-Western Hotel. At the conclusion of the dinner, Mr. Griffith, on behalf of those present, thanked most heartily Messrs. John Aird and Co., the Mayor of Southampton, and the other gentlemen to whom reference has been made, for the great trouble taken by them to make the visit a success. Thus ended a day which was admitted by all to have been most pleasant and instructive.

MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.

The members of the Association paid a visit on Saturday to the gas-engine works of Messrs. J. E. H. Andrew and Co., Ltd., at Reddish, near Stockport. The party were received by Mr. R. Bellamy and several members of the staff, by whom they were conducted through the various departments.

The first department visited was the gas-producing installation, which provides Dowson gas both for driving the works and for testing purposes. Its capacity is about 100 brake horse power. The party next inspected the smithy, where a good many of the forgings used by the firm are made. This was followed by a visit to the stores, which contained a large stock of the various parts of the "Stockport" gas-engines. After looking in at the pattern-shop and castings-store, the members came to the main shop, which occupies an area of about 408 ft. by 75 ft., including the old shop, and the new portion 120 ft. by 75 ft., and is traversed by two electric cranes, of 10 and 5 tons capacity respectively. The driving power is obtained from several engines, two of which are coupled to dynamos for developing the electric light and the power for the cranes. The works are equipped with plant of most modern description for the various processes of gas-engine construction, and particularly with machinery for the production of engines of the larger sizes, to which Messrs. Andrew devote special attention. The smallest engine made by the firm is of 2 horse brake power; while in connection with the larger sizes it may be mentioned that they have recently supplied two 200-horse power double-cylinder engines to Messrs. Nettlefold, two of 250-horse power to the United Alkali Company, and two of 300-horse power each to the "Chronicle" printing works in Manchester. Messrs. Andrew have on order at the present time a 200 brake horse power engine for Messrs. Monks, Hall, and Co., to work with Mond gas. One of the most interesting features in the works is the testing department, where the members had an

* See "JOURNAL" for May 27, p. 1427.

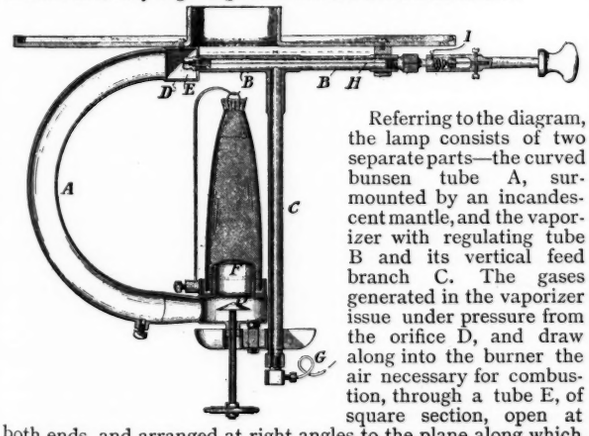
opportunity of seeing an engine of 90-horse power started on the testing-stand, and the variations in speed recorded on a Moscrop machine. Every engine is tested before it is sent out, and a record kept of its performance on the stand. The firm have in contemplation a large extension of the works, by which their capacity will be more than doubled.

In the course of conversation with members of the party, Mr. Bellamy stated that they had worked with all sorts of gas. They had tried acetylene, but their experiments had been of only limited character, because it was much too expensive to burn in a gas-engine. In reply to a question as to the effect on gas-engines of water gas mixed with coal gas, Mr. Bellamy said that, in order to get a good result with a considerable proportion of water gas, a re-setting of the valves was necessary to secure the proper mixture in the engine. Mond gas was another agent that was coming forward, and causing a considerable amount of controversy. As he had mentioned, they were building a 200-horse power engine to work with Mond gas at Warrington. A question was asked as to the utilization of the waste gases that were found after the explosion. Mr. Bellamy replied that there was a considerable amount of heat lost; but to secure any benefit from it, the appliance necessary would be such that it would absorb all, or almost all, the energy the waste gases could generate.

Before the party left the works, Mr. Stoddart proposed a hearty vote of thanks to the firm for allowing the members of the Association to go through the works, and to Mr. Bellamy and his assistants for their courtesy in showing them through the various departments, and for the interesting information they had given. Mr. Sosbe, in seconding the motion, remarked that the visit had been a source of instruction to all. To members of the gas industry, all the information they could obtain in regard to the details of gas-engines was matter of interest, and would frequently be very useful. Mr. Bellamy, in responding, said he and his assistants had done their best to make the visit pleasant and interesting, and he would inform his brother (Mr. A. R. Bellamy), the Managing-Director, who was on the Continent, of the hearty manner in which the members had appreciated what they had seen and had had explained to them during their inspection of the works.

THE KORNFELD ALCOHOL LAMP.

In a "Note" in the last number of the "JOURNAL," an illustrated description was given of the Washington alcohol lamp, which, in conjunction with the Kornfeld, or Russian Imperial lamp, was employed in lighting the dome of the Salle des Fêtes during the recent Alcohol Exhibition in Paris. We are now in a position to give some particulars in regard to the latter lamp, of which the accompanying illustration shows a vertical section. The lamp has been designed with the object of furnishing a cheap high-power light which can be employed in substitution for the electric arc, and be distributed to great distances. A hermetically closed receiver is placed at any convenient spot, as far from the lamps as may be desired, and only communicating with them by tubes as fine as electric wires, for leading the fluid under pressure from the receiver. Admission to the tubes, which are independent of each other, is afforded or shut off by small cocks like electric switches. The tubes only convey cold liquid, and not gases or vapour, so that there can be no fire or explosion, even in the case of a volatile liquid, such as alcohol; while spirit of any nature may be employed,—ethylic, methylic, or amylic, raw or rectified, pure or mixed with any carburizers. The gases and vapour are only generated at the moment the liquid reaches the vaporizer, and in exact proportion to the consumption of the bunsen burner, the flame of which raises the vaporizer to a sufficient temperature for effecting the gasification. In this manner the lamp, when once started by a short preliminary heating, acts quite automatically, the bunsen flame raising the mantle to a very high degree of luminous incandescence.



Referring to the diagram, the lamp consists of two separate parts—the curved bunsen tube A, surmounted by an incandescent mantle, and the vaporizer with regulating tube B and its vertical feed branch C. The gases generated in the vaporizer issue under pressure from the orifice D, and draw along into the burner the air necessary for combustion, through a tube E, of square section, open at both ends, and arranged at right angles to the plane along which the section given in the illustration is taken. The combustible mixture issues from the burner by the dished and perforated plate F; and the consequent flame renders the mantle incandescent, while at the same time heating both the vertical pipe C of the vaporizer and the portion of tube B immediately above the mantle. The oil or alcohol under pressure reaches the vaporizer by the small pipe G, connected with the tube C by the screw union shown. The liquid rises in C, where it is transformed into gas and vapour by contact with the heated metal; and the pressure of the gases thus generated soon balances that to which the liquid is subjected in the receiver. From this time the liquid can only advance in the vaporizer in proportion as the gas and vapour issue from the orifice D, the diameter of which is only 0·3 millimetre for heavy petroleum, and 0·5 millimetre for rectified petroleum or alcohol, with corresponding pressures on the liquid of 3 and 2 kilogrammes per square centimetre (42 lbs. and 28 lbs. per square inch) respectively. This orifice may be regulated at will by the needle H, which is also intended for freeing it from any deposit left owing to the gasification of the liquid. The needle is held firmly in its carrier by clamping-screws, and it is worked backwards and forwards by turning the knob; the small screw I constituting a stop to limit the backward movement of the carrier, and therefore of the needle, which passes through a packing of asbestos. The orifice D occupies the centre of a special part of the lamp, made of two pieces—the plug proper and the filter-carrier, on which is wound an asbestos cord for filtering the gas and vapour before they enter the orifice. To allow of the asbestos cord being renewed and the part cleaned, it can be unscrewed from the plug. The vaporizer can also be removed by releasing the collar of the horizontal portion. The Kornfeld lamp may be regulated by altering the quantity of gas and vapour entering the burner by means of the needle H; and the quantity of air admitted to the burner may be varied by a regulator constituted by the conical valve J, which is raised or lowered by turning the handle. For starting the lamp, the vaporizer must first be heated by burning a little alcohol in the oval dish fastened below the burner; while for bringing it quickly into action a little alcohol should also be poured into the groove round the burner.

It is stated that, with a little practice, the maximum of effect with the minimum of expenditure, may soon be obtained—viz., 700 candles per litre (1·3 pint) for about four hours' lighting, or 300 candles per litre for double that period, according to the size of the lamp. Official trials made last November at the laboratory of the Paris Municipal Council showed that the lamp has an illuminating power of 634 candles with an expenditure of only 230 grammes (7 oz.) of carburetted alcohol per hour.

CONTINUOUS REVIVIFICATION OF OXIDE IN A SMALL GAS-WORKS.

Herr F. Breitkopf, the Manager of the Municipal gas-works at Wolfenbüttel, in Brunswick, reports in a recent number of the "Journal für Gasbeleuchtung" that for the last three years he has had difficulties to contend with, owing to his purifying plant having become too small—necessitating (especially in the winter months) changing the four purifying vessels in action every fourth day. The disagreeable work of emptying the purifiers so frequently led to trouble with the workmen, some of whom complained of inflammation of the eyes, and others of pains in the chest and loss of appetite. Higher wages had to be paid; to say nothing of the loss of gas consequent on the daily opening of the apparatus.

To overcome these difficulties, and to avoid for a time enlarging the whole plant, he decided to adopt the plan of admitting air. After studying a pamphlet issued by the firm of Klempt and Bonnet, of Duisberg, on the admission of air to purifiers, he applied to them and they placed their air-admission apparatus at his disposal. The apparatus started work on Dec. 3, 1901. The stokers were instructed in its use, which of course was not easy at first, as the valve had to be brought to the proper position for the correct admission. The best position for the apparatus is, he says, near the station meter, which has to be read hourly. Then, by means of a three-light dry gas-meter in the air-supply pipe, the volume of air admitted is read off and controlled accordingly, The method fully answered Herr Breitkopf's expectations. The effects on the purifying material were surprising. Each purifier lasted more than four weeks; and, quite apart from the saving in wages, the workmen enjoyed better health.

The apparatus, according to Herr Breitkopf, pays for itself in a few weeks; the increase in gas being not inconsiderable, and soon showing as a higher yield from the coal. A portion of the air, representing, it is said, 40 per cent. of the oxygen, and therefore 8 per cent. of the whole of the air admitted, becomes combined in the purifying material. The remaining air is so much gain to the make of gas, as it becomes carburetted by the benzol vapours in the crude gas. If no air were admitted, these vapours would be thrown out unused. It may be accepted, says Herr Breitkopf, that at least nine-tenths of the air introduced is gained as gas.

The cost of the air-admitting apparatus, including setting up

and the gas-meter, was £18 15s. In 84 working days 182,000 cubic feet of air were admitted. Assuming that nine-tenths of this—viz., 164,000 cubic feet—remains in the gas, then at a value of 1s. 5d. per 1000 cubic feet, this represents a gain of £11 11s. In the same working time previously, £10 18s. 6d. had been paid in wages; but after the introduction of the apparatus the wages dropped to £1 11s. 6d.—thus showing a saving of £9 7s., or with the £11 11s. for the increased volume of gas, making a total gain of £20 18s. Thus during the short period of trial, the apparatus had already paid for itself.

REGISTER OF PATENTS.

Gas-Producers.—Herring, W. R., of Edinburgh. No. 12,887; June 25, 1901.

The patentee says his arrangement primarily consists in having the gas-outlet port of the producer at a point below the normal surface of the fuel-bed, but sufficiently high above the base of the fire to ensure the conversion of the carbonic acid produced by the primary combustion in the lower strata of fuel, into carbon monoxide and other gases by its passage through the mass of incandescent fuel on its way to the gas-outlet port. This port is fixed at a point beneath the normal surface of the fuel in the producer—thus sealing the gas-outlet, and compelling the volatile matters issuing from the newly-fed fuel to pass downwards through the mass and become converted into fixed gases on its passage to the outlet-port through the incandescent fuel. "The slight pressure resulting on the surface of the fuel-bed in the upper part of the producer also preventing the ingress of air and the premature combustion of the gas resulting in a loss of fuel and the destruction of the upper part of the producer. By this means, pure gas of a consistent quality will issue from the producer instead of the volatile matters, consisting of hydrocarbons, water vapour, steam, and such like, passing off with the gas as at present, impairing its utility, and resulting in a loss of fuel and the reduction of the flame temperature where the gas is ultimately employed."

The invention is applicable to all purposes where heat is required—such as coal-gas retort settings, puddling-furnaces, glass-furnaces, steam-boilers, metallurgical furnaces of all descriptions, and such like—and can be constructed either in direct association with the respective plants or as a separate plant; the gas being conducted to the different points to where it is required by means of a conduit, and only requiring a supply of air to bring about its combustion as desired.

Fig. 1 shows a transverse section of a producer with the gas-outlet port shown in position at A dividing into a double duct or channel at B and C, each governed by dampers. D is the producer-door, wherein the fuel is fed; E, the door from which the clinker and ash are removed periodically; F, a water-pan; and G, fire-bars and supports. Fig. 2 is the cross section of the same on a line 1 2.

Fig. 3 exemplifies a different method of feeding the producer and conducting the gases therefrom; A being the main gas-outlet from the producer B discharging into the ducts C and D.

Figs. 4 and 5 show a producer and Lancashire boiler. Fig. 4 is a common type of producer with the feeding-door A, clinkering-door B, poker-holes C, air-blast pipe D, but with the improved method of taking off the gases by the outlet E at a point below the normal surface of the fuel-bed, and at the point where the carbonic acid gas resulting from the primary combustion at the base of the fire is found to be converted into carbon monoxide in consequence of its passage through the incandescent carbon mass. This point will be variable in accordance with the characteristics of the fuel employed; but by introducing a number of outlet-ports regulated by damper-slides, this can be easily ascertained and varied at will. Fig. 5 illustrates the means of conducting the gases to the fire-flue of a Lancashire or Cornish boiler.

Fig. 6 represents a cross section of one or more producers A placed side by side, and forming part of the structure of the boiler-setting; portions of the setting being fire-clay tiles lying upon the tubes, and acting as baffle-plates to direct the current of gases in the directions indicated by the arrows. B is the gas-outlet port from the producer feeding into a gas-duct C, from which the gases are emitted through the ports into the combustion chamber D. E shows an arrangement for pre-heating the air required for secondary combustion prior to its emission into the combustion chamber D through the ports. F shows an arrangement for jacketing the producer-front by means of checker brickwork, through which the primary air for supplying the producer can be pre-heated by being made to pass through it. G is an air-blast pipe for forced draught, provided at its top with a perforated cap. As shown in this figure, the pipe G and cap are in position for the producer to be used as a solid hearth; but by lowering the pipe and cap, the producer may be used as a grate-bar forced blast-furnace. When the producer is used as a solid-hearth producer, the fire-bars are withdrawn and the ashes and clinker allowed to accumulate and bury the blast-pipe projecting above the level of the furnace-base. As there are usually some 6 or 8 inches of water in this portion of the producer, under all circumstances of working, the steam and moisture arising from this would be sufficient to protect the blast-pipe, which, in a sense, would be projecting into the fuel-bed. The perforated cap referred to is merely to prevent the ashes in the one case, or the fuel in the other case, from falling into the blast-pipe which projects above the base of the furnace.

Fig. 7 shows an ordinary type of producer A, with the improved method of taking the gases therefrom, illustrated in a different manner. Instead of one outlet-port fixed at an unalterable level, there are three, B, B^1, and B^2, regulated by water-jacketed valves, which permit of the gases being drawn from any of the three levels indicated; so that, in the event of the fuel-bed becoming low, the valve C would be closed, and the gases be taken off through the valve D. In the event of the valve D becoming unsealed, the valve E would be opened and the valve D closed; or the gases may be drawn from any, or all, of the valves, which, so long as the fuel-bed is above the port, still permit of the apparatus being worked in the ordinary way.

The gases from the various levels can be conducted away separately, and dealt with in accordance with their chemical composition for different purposes. For instance, in the event of bituminous fuel being used, the volatile products generated in the upper part of the producer can be conducted away through the upper ducts, and branch-pipe C^1,

Fig 1 Fig 2 Fig 3

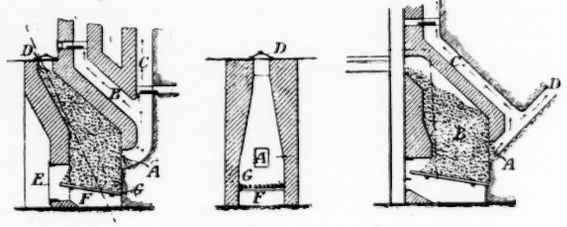


Fig 4.

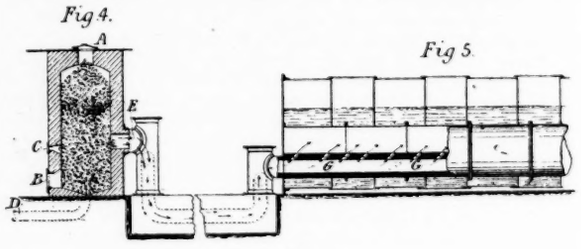


Fig 5.

Fig 6.

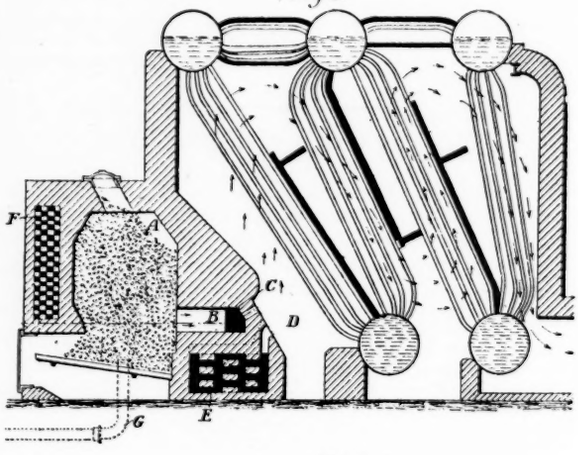
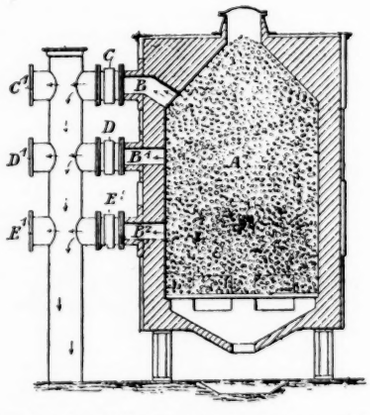


Fig 7.

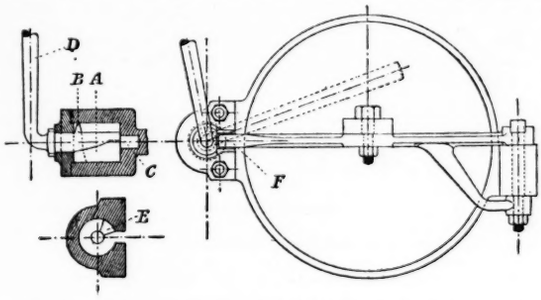


to a suitable receptacle yielding an illuminating gas; while from one or more of the lower ports an illuminating gas, of a poorer quality, will be given off (suitable for gas-engines and the like), which may be conducted to a receptacle by means of a branch-pipe D^1; while fuel gas of constant quality, free from hydrocarbon mixtures and water vapours, will emanate from the lower port, and which may be conducted to another receptacle by means of a branch pipe E^1; shut-off valves being provided on the main duct C to keep the said gases separate.

Retort-Lid Fastener.—Kew, H. E., of East Ham. No. 13,096; June 27, 1901.

This arrangement (p. 217) consists of two combined cams A B. The former is inclined, running parallel with the spindle C; the latter is wormlike around the spindle. The continuation of the spindle forms the hand-lever D. There is a box on the mouthpiece to receive the

cams, with an opening in it for the end of the cross-bar F. When the door is open, the hand-lever lies upright against a stop E inside the box; but, on closing the door, the end of the cross-bar enters the opening in the box, and strikes on the incline of the cam A, causing both cams to revolve. The hand-lever D thereupon falls; and the cam B secures the end of the cross-bar. For an additional adjustment, the cross-bar F is hinged with an eccentric-pin G with a T head let

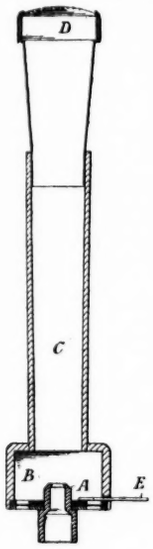


into the cross-bar F—to be reversed when the eccentric pin in the centre of the cross-bar is spent. It is then reversed, and starts its process again.

Where self-sealing is not necessary, the cam B can be used by itself as a fastening for a door, without using the cam A at all. In the engraving, the door on the retort mouthpiece when nearly closed is shown in full lines; and when closed entirely, in dotted lines.

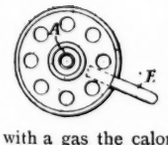
Obtaining Light from Gases of Low Calorific Power.—Chamberlain, J., of Catford, S.E. No. 13,191; June 28, 1901.

The patentee's proposal is to burn low-grade gases (defined by him as 135 to 150 B.T.U.) "in sufficient volume, and at a suitable velocity, to produce a flame of sufficient temperature and suitable size to bring a mantle to a high state of incandescence."



A volume of gas of not less than (say) 30 cubic feet per hour is employed, at a pressure of 2 inches. From the nature of his experiments, the minimum volume which the patentee finds can be employed to obtain any satisfactory result is 20 cubic feet per hour, at the pressure named. The calculated velocity of the volume of gas employed will equal about 55 lineal feet per second. Gas flowing at this velocity will draw in air to support combustion at the rate of 41·25 cubic feet per hour in an apparatus like that shown.

The orifice of the gas-nozzle A will be about ⅛ inch diameter, and will open into an air-chamber B, as usual. From the top of the chamber extends upwardly a taper tube C, the diameter of which at the inlet is (say) ⅝ inch, with a taper comparatively slight for a distance of about 4 inches. From this point, the taper increases more rapidly; so that at a distance of 6 inches from the nozzle, the diameter of the tube will be 1 inch. At this spot, the tube is provided with a cap or disc of reticulated material D, to prevent lighting-back. The air enters the chamber B through ports, the area of which may be regulated by a hit-and-miss arrangement, provided with a handle E.



Concluding his specification, the patentee says: "I find it important for the success of my invention that there shall be a free flow of gas from the nozzle to the reticulated material at the top of the burner tube, in order that the requisite velocity shall be maintained to draw in the required amount of air to produce a hot flame of small volume. I would remark that the means described have been found to answer perfectly with a gas the calorific value of which is about 150 heat units; but with gases of lower calorific value, it may be necessary to slightly modify the dimensions of the various parts. I would further remark that the conditions for burning coal gas for incandescent purposes are entirely unsuited for burning gas of low calorific value, which is the object of my invention; and from a series of exhaustive experiments which I have made, I have found that no coal-gas burner that I have been able to obtain is of the slightest use for the purposes of my invention. In making this statement, I would have it understood in a practical sense, because a mixture of any combustible gas and air will give a flame having some heat value, and a mantle placed in such flame will in parts be brought to a state of glow which will give off a certain amount of light, but nothing that is of any practical value for gas-lighting purposes. It will be obvious also, from the nature of things, that the burners employed for both purposes are likely to bear a resemblance in certain general features, but such coal-gas burners cannot be considered as anticipating my low-grade gas-burner—the conditions being so entirely different."

Manufacture of Coke and Gas.—Lowe, T. S. C., of Los Angeles, California. No. 7826; April 3, 1902.

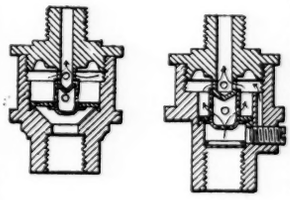
The object of this invention is "to improve the process of manufacturing coke, whereby a portion of the gas evolved from the coking material is utilized to keep up the heat of the ovens and of a superheating chamber, when such chamber is used, and the remainder of the gas is utilized in the form of a fixed gas by permitting steam to pass through the ovens and mixing the decomposed steam with the gas evolved from the material which is being coked."

The process is intermittent—continuously and progressively converting coal into coke, and intermittently recovering gas from the charge, by alternately admitting air into the upper parts of the ovens and connecting flues at successive points (whereby, through the combustion of the air and the evolved gases, the ovens are heated above the body of coal), and then shutting off the air and passing steam through the ovens above the body of coal (whereby a kind of water gas is produced from the volatile products from the coal), and recovering the combustible gases produced. During the steaming period, oil may be admitted to the ovens, to produce illuminating gas; and during the heating period, a small amount of oil or tar may be sprayed over the charge, to protect the latter from any undue proportion of oxygen that may be admitted.

The apparatus (illustrated by four sheets of drawings) consists of a train of coking-ovens connected by flues, and having at each end a chequer-brickwork superheater, and a generator consisting of a casing filled loosely with crossed bars of iron, to which air and a water spray (for the generation of steam) may be admitted alternately. Air inlets are provided at successive points in the flues. The direction of the gases is reversed periodically, so as to heat up the superheater and generator at each end. To prevent explosions, the apparatus is freed from combustible gases between the periods by means of a current of steam. This is a bare outline of a lengthy specification extending to more than eight pages; while there are no less than 64 separate claims for the invention.

Gas-Governors.—Goodson, J., of Maze Pond, S.E. No. 11,212; May 15, 1902.

This is a burner-governor fitted with a floating diaphragm. In the first modification shown, the casing is a bored cylindrical chamber, in which freely works a floating diaphragm having a central tube provided with perforations for the passage of the gas to the main chamber. The central tube forms a sleeve working freely on a bored guide projecting from a screwed cap, and having perforations which permit the passing of the gas from the inlet-chamber through the bore to the burner. A sharp edge is formed in the bottom of the chamber on which the diaphragm normally rests, in order to prevent sticking; and a gauze wire diaphragm is secured in the end of the screw-threaded socket. So long as the supply pressure remains normal, the float is in its lowermost position—admitting a full supply of gas to the burner; but should the pressure be increased, it acts on the underside of the float and raises it. This causes the upper orifice of the tube to approach the perforations in the bored projection on the cap, and throttle the supply until the pressure is reduced to the normal; the rate of consumption being determined solely by the diameter of the inlet-orifice.



In the second arrangement, there is, in addition, a regulating device provided, comprising a bye-pass connecting between the top and bottom of the diaphragm, and the size of the orifice of which is regulated by means of a screw. In this way, says the patentee, the effective passage area may be adjusted to suit different consumption and qualities of gas.

APPLICATIONS FOR LETTERS PATENT.

15,061.—Craven, J., "Distillation of coal tar." July 7.
15,125.—Thies, C.E., and Lowrey, L. E., "Incandescent gas and other lamps." July 7.
15,126.—Bouchaud-Praceiq, E., "Carburetting air." July 7.
15,141.—Garde, H., "Carburetting air." July 7.
15,154.—Johnson, J. Y., "Manufacture of lighting and heating gas." A communication from the Deutsche Continental Gasgesellschaft and J. Bueb. July 7.
15,191.—Stevenson, G., "Rotary engines or pumps." July 8.
15,261-2.—Bullier, L. M., and Maquenne, L., "Purification of acetylene or other gases." July 8.
15,340.—Ross, J. H., "Acetylene gas generators." July 9.
15,359.—Elworthy, H. S., and Williamson, S., "Manufacture of gas." July 9.
15,361.—Burden, E., "Gas-stoves." July 9.
15,432.—Parsons, Hon. C. A., "Steam and gas turbines." A communication from C. E. L. Brown. July 10.
15,439.—Tourtel, J., "Seal padlocks." July 10.
15,440.—Lambotte, C., "Internal combustion engines." July 10.
15,498.—Tonkin, W. W., and Puplett, S., "Gas-producers." July 11.
15,506.—Holmes, P. F. & E. W., and Cameron, E. G., "Fastenings for gas-purifier covers." July 11.
15,520.—Scott-Snell, C., "Incandescent gas-lamps." July 11.
15,574.—Kent, A. W., "Gas-burners." July 12.

What may justly be called an engineering feat recently saved Warrington from a water famine. The water from the Winwick wells had been drawn so low that it was reckoned that the supply would be exhausted in a week. It was under these circumstances that Messrs. Simpson and Co. were applied to; and they promptly dispatched to Warrington, by special train, pumps and machinery which, by continuous work, they had in position before the wells had run dry. In a few days they were pumping a million gallons a day additional water into the reservoirs. Thus, in less than a week, an imminent complete water famine in a town of 70,000 inhabitants was averted.

CORRESPONDENCE.

[We are not responsible for opinions expressed by correspondents.]

Rate-Aided Competition.

SIR,—The success of the South Metropolitan Gas Company in the matter of the "self-supporting" clause of the Bermondsey Electric Lighting Provisional Order is very encouraging; and the thanks of all those who have strenuously opposed such rate-aided competition as this clause is intended to obviate is due to the officials of that Company.

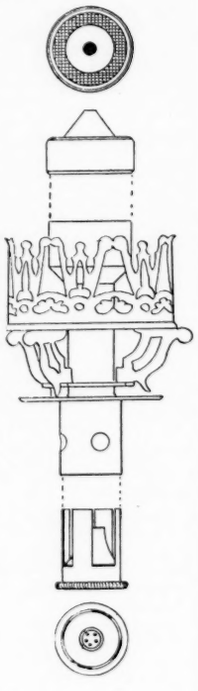
I cannot help thinking, however—and that is why I trouble you—that the clause does not go quite far enough; for apparently there is still nothing to prevent local authorities charging for public lighting and for the lighting of public buildings such as you refer to in the "Electric Lighting Memoranda," p. 145 of your current issue, at fictitious rates. It is obvious that if a fictitious charge is made in this way, the whole body of ratepayers have to bear the burden of supplying private consumers at under cost. It is generally argued, on behalf of a local authority supplying electricity, that it is an advantage to the undertaking to do public lighting as well, owing to the increased load. This, of course, under some circumstances, is perfectly true. But nevertheless, in spite of the advantage claimed, the ratepayers generally have to pay top price; for it is notorious that municipalities will charge for their own supply what they will not give anybody else for the same. To emphasize this point, I need only remind you that locally the public authorities could purchase current from my Company for public lighting at a very considerable saving on what they now charge the ratepayers for their own supply.

CHAS. F. BOTLEY.

Hastings, July 17, 1902.

Cleaning Incandescent Gas-Burners.

SIR,—Referring to your editorial note as to the want of a cheap, respectable burner, I write to point out that yet a third qualification is required, which is equally important—*i.e.*, that it will afford ready facilities for cleaning, since, especially in dusty places, this is not the least important part of the duties which "maintenance" involves. I have for some time been endeavouring to get certain burner manufacturers to realize this point.



The disadvantages of the present ordinary burner consist of the fine thread with which the burner top is attached to its tube, and the fine thread by which the tube is attached to the nozzle piece. I suggested that, in place of these fine screws, sliding appliances should be substituted. At least two manufacturers have at last succeeded in supplying me with the ordinary incandescent burner with a sliding top; but as the sliding attachment to the nozzle appeared impossible to them, I have had to make it myself.

The sketch shows the method of construction; and I send it so that your readers who are interested in the maintenance question might try a few for themselves, in order to determine whether its use is advantageous.

CHARLES CARPENTER.

South Metropolitan Gas Company, July 18, 1902.

Gas Profits at Widnes.

SIR,—Alluding to the remarks of my Chairman (Mr. Alderman Timmis, J.P.), reported in your issue of the 15th inst., *re* the amount of profit on the Widnes gas undertaking for the year ending March 25 last, the statement of gross profit being £2793 should read net profit.

The gross profit on the year's working, before providing for interest and sinking fund, is £5811, leaving a net profit of £2793; and after deducting a further sum of £1624 which is handed over to the relief of the borough rates, a balance of £1169 remains.

ISAAC CARR.

Widnes, July 16, 1902.

A system of high-pressure salt-water mains has been completed in Philadelphia which ought to prove of value in checking fires. At a recent test of the work already completed, the hydrant pressure is reported to have run as high as 180 lbs. per square inch, and streams of water were thrown well above tall buildings. The system, though to be used only for fire service, is connected to the Belmont reservoir pipes by a check-valve, so that the regular low-pressure supply can be employed in an emergency.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The following further progress has been made with Bills:—

Bills read the third time and passed: East Worcestershire Water Bill, Glasgow Corporation (Gas, &c.) Order Confirmation Bill, West Gloucestershire Water Bill.

HOUSE OF COMMONS.

Friday, July 18.

LONDON WATER (RECOMMITTED) BILL.

The consideration of this Bill by the House in Committee was resumed to-day—the Right Hon. J. W. LOWTHER in the chair.

On the first sub-section of clause 1, specifying that the purpose for which the proposed Water Board should be established should be "acquiring by purchase and managing and carrying on the undertakings" of the Water Companies,

Mr. LOUGH moved an amendment to omit the words "and carrying on." He said he was afraid that they might be found to have a seriously limiting effect, and be taken to indicate that the Board must necessarily continue to carry on the undertakings of the Companies which they were to acquire, and even to carry them on in very much the same form as at present. Another objection to the clause as it stood was that it would cause confusion of administration among a number of large towns in the water area, for hardly any two of them would be treated alike. He thought the Committee should aim at securing equality of treatment as between the different Municipalities. He asked the President of the Local Government Board if it was absolutely necessary to impose on the Water Board the duty of carrying on the water supply of London in the form of eight undertakings.

Mr. LONG, in opposing the amendment, declared that its adoption would reduce the Bill to nonsense. The object of the measure was to enable the Water Board to purchase and carry on the existing undertakings; but there was nothing in it to justify the conclusion that the supply would be conducted in precisely the same manner as in the past. The Board would have all the powers and duties of the Water Companies, and would be able to effect such reforms as might seem to be desirable. Parliament was doing all that was reasonable and just in establishing the Board. If in the future further powers were required, they would be applied for. The amendment would deprive the Board of powers which they obviously should possess.

Mr. BUXTON said those who were in favour of the amendment feared that the retention of the words it was proposed to strike out would compel the Board to carry on the eight undertakings separately. The amendment raised the question of the suitability of the proposed new authority to manage and carry on the water supply of London. In the small towns within the water area, the power of supply was to be given to the Municipalities; but in the Metropolis a different system was to be adopted, and it was proposed to create a fantastic body totally unknown to municipal life. They desired to elicit from the President of the Local Government Board the reasons which had induced him to alter the municipal system in the case of London. Very many of the interests represented on the proposed Board would be antagonistic, and it would be found that the new authority would be less capable of carrying on the supply than the Companies had been.

Mr. COHEN considered the amendment a very unbusinesslike proposal, for it would prevent the Board from exercising the powers which it was the object of the Bill to transfer to them.

Dr. MACNAMARA thought the Bill itself was unbusinesslike. If they had an assurance that the question of the number and constitution of the Board would be left to the decision of the Committee, no doubt the Bill could be made a good workable measure. But they must get rid of the grotesque authority it was at present proposed to set up.

The Committee divided, and the amendment was lost by a majority of 29.

Mr. LOUGH then moved an amendment providing that the Board should supply water in bulk to the various Local Authorities. He said he thought this would be a much better system than the one embodied in the Bill; and, moreover, it had received the support of nearly all the authorities affected by it.

Mr. LONG said he could not possibly accept the amendment, because it would be directly contrary to the whole principle of the measure. If adopted, the proposal would involve an enormous initial expense, and would obviously deprive the new authority of any opportunity of raising sufficient revenue to do the very work which honourable gentlemen opposite were specially anxious it should do—namely, reduce the cost of water in the London area.

Mr. BUXTON pointed out that the County Councils would unquestionably prefer severance; but, short of that, the majority of them would rather have the water supplied in bulk than come under the proposals contained in the Bill.

Sir R. REID suggested that the question should be raised by a separate clause.

Dr. MACNAMARA proposed, as an amendment to the amendment, to add the words "if so required," and this was agreed to.

Mr. LONG thereupon stated that if a new clause were put down, he would consider it.

Finally, the amendment as amended, was withdrawn.

An amendment standing in the name of Mr. Allen, to add to the sub-section the words, "Providing that nothing in this Act shall prejudice any future application that may be made to Parliament on

behalf of any County or District Council for withdrawing the whole or any part of the area under its control from the said limits of supply," was regarded by Mr. Long as superfluous, and was negatived without a division. The second sub-section of the clause specified as follows: "The Water Board shall be a body corporate with a common seal, having power to acquire and hold land for the purposes of this Act without licence in mortmain." An amendment which stood in the name of Mr. Burns to omit this sub-section was not moved.

The Committee next proceeded to the third sub-section, which set forth that the Water Board should consist of a Chairman, a Vice-Chairman, and 71 other members; that the Chairman and Vice-Chairman should be appointed by the Board, and the other members by the constituent authorities specified in the third schedule; and that the number of members to be appointed by each authority should be that mentioned in the schedule.

Dr. MACNAMARA moved to omit the sub-section, in order to raise the question of the number and constitution of the proposed Board. He said he thought the Board was too large, and that it should be reduced by one-half, and that the representation should be confined to the county areas. The borough areas were included in these, and would thus secure their representation. Having regard to the financial arrangements of the Bill, he considered this the fairest course.

Mr. LONG recognized that the points alluded to might properly be discussed; but he said it was inconvenient to discuss them on a proposition to omit the clause. It would be much better to withdraw the amendment, and take the discussion on detailed amendments. He added that if there was to be a Board at all, it was obvious that it must be constituted in some shape or another; and to omit the whole of the sub-section would leave the Bill in a very incomplete form.

Mr. BUXTON admitted that there was force in these objections; but he thought it should be understood that there would be proper opportunity of discussing the separate questions of the size and constitution of the Board.

Mr. LONG said he was quite convinced that if this matter were left to the decision of the Committee in the most open form the result would not vary in any degree from what it would be by the adoption of the ordinary course. Out of the 63 London members, there were 55 who supported the proposals of the Bill; and the members for the adjoining districts did likewise.

Dr. MACNAMARA gathered that the right honourable gentleman intended to adhere to the proposed number of the Board. He must therefore press his amendment.

Mr. LONG pointed out that there were two quite distinct questions raised, one of which was the actual number of the Board. Upon this he had said, and he now repeated, that if a proposal were made for the reduction of the number, which was consistent with the principle underlying the constitution of the Board, he would be prepared to leave it to the House. But what was proposed now was not only that the number should be reduced, but that the principle of representation of the Metropolitan Boroughs should be overruled. To this he could not agree.

The Committee then divided, and the amendment was rejected by a majority of 37.

Mr. BUXTON next moved an amendment to provide that the Water Board should consist of 35 members, instead of 73, as proposed in the Bill. He held that the figure contained in the measure was purely arbitrary, and that his proposal was a fair compromise. He did not altogether approve of the number he submitted; but it had been put forward by the majority of the Joint Committee, and he accepted it as, at any rate, calculated to make the Board a workable body. Looking at it as a whole, and at what it would have to do, he believed it would be an unworkable, expensive, and inefficient body.

Sir E. VINCENT, as a member of the Joint Committee who considered the Bill, was convinced that the proposal of the Government could claim the merit of being more directly representative of the water consumers than the amendment. He submitted that, for the purposes of administration, there was little or no difference between a Board of 70 members and one of 35. He felt confident that if the Board, as proposed by the Government, was established, it would carry through its work efficiently; that it would deal with the most difficult problem of the transfer of the water undertakings with a full regard to the rights and interests of the ratepayers of London; and that, by the unity of authority which would be established, the whole problem of water supply of an enormous population would be attacked with a thoroughness and ability impossible under present circumstances.

Mr. M'CRAE, speaking also as a member of the Joint Committee, submitted that there was no evidence to support the proposal for a large Board, and that there was no reason why the Metropolitan Boroughs should be represented on that body. He wished to protest against the conduct of the case before the Joint Committee by the promoters of the Bill, who practically refused to give evidence until they were challenged by the Chairman.

After some further conversation, Mr. Buxton withdrew his amendment, on the understanding that Mr. Long would himself move one to omit the words "seventy-one," and also the latter part of the sub-section from the word "appointed," so as to allow of the insertion of what was at present set forth in the third schedule to the Bill. This, Mr. Long observed, would bring the whole question of the Board under the purview of the first clause. Before the part of the sub-section on which Mr. Long's proposed amendments could be moved had been reached,

Mr. CREMER moved to omit the words "Chairman, a Vice-Chairman, and." He held that the appointment of these officers might be left to the Board when constituted.

Mr. LONG opposed the amendment, and it was rejected by 191 to 95.

The words "seventy-one" were then left out of the clause.

MR. WHITMORE moved that for the first three years after the appointment of the Board the Chairman and Vice-Chairman should be appointed by the Local Government Board.

Mr. BUXTON said he did not think it right that these appointments should be taken out of the hands of the members of the Board.

Mr. LONG said it was very important that the first appointments should not be haphazard. He had great difficulty in arriving at a decision, and he proposed to leave the matter to the judgment of the Committee, accepting any conclusion they might arrive at.

On a division, the amendment was carried by a majority of 35, and progress was thereupon reported.

The following further progress has been made with Bills:—

Lords Bills read a second time and committed: Gas and Water Orders Confirmation Bill (No. 2), Ystradfellte Water Bill.

Lords Bills reported: Devonport Corporation (Water) Bill, Gas Orders Confirmation (No. 2) Bill, Leicester Corporation Bill, Menai Bridge Urban District Council Bill, Water Orders Confirmation Bill, Whitstable Improvement Bill.

Lords Bill read the third time and passed: Glasgow Corporation (Gas, &c.) Order Confirmation Bill.

LEGAL INTELLIGENCE.

The Supply of Water for Swimming-Baths.

In the Court of Appeal last Saturday, Lords Justices Vaughan Williams, Romer, and Stirling had before them an appeal by the Barnard Castle Urban District Council from a decision of Mr. Justice Buckley in August last, raising the question whether a local authority, being the water authority for the district, were bound to furnish water to a swimming-bath connected with a school at the ordinary rate charged for a domestic supply. The case was reported in the "JOURNAL" for Aug. 13; and it may be remembered that his Lordship decided that they were. In support of the appeal, it was contended that a supply of water to a swimming-bath was not, even when the bath was connected with a private house, a domestic one; and as in this case it was used for the purposes of a school, which was a business, the supply was for a trade purpose. Their Lordships allowed the appeal. Our report of the case is unavoidably held over till next week

The Winding Up of Phôs, Limited.

A winding-up order having been made on the 17th of June against this Company, the usual meetings of creditors and shareholders were held last Wednesday at the Board of Trade Offices, Carey Street, W.C.—Mr. G. S. Barnes, Senior Official Receiver, presiding. The Chairman said he had that morning received from the Directors a statement of the Company's affairs, in which the unsecured liabilities were estimated at £3407; but this sum did not include claims amounting to £7964 made against the Company by certain omnibus proprietors. The liabilities on debenture bonds amounted to about £5000, while the assets were estimated to produce £6614. The business of the meeting was to appoint a Liquidator; and Mr. F. D. Leslie was nominated. At the shareholders' meeting, the Chairman reported that the Company was registered on April 29, 1901, with a nominal capital of £30,000, which was increased in May, 1902, to £60,000. It was formed to acquire the business of the Phôs Acetylene Gas Syndicate, Limited, which was registered in August, 1900. By an agreement dated April 29, 1901, the Company agreed to purchase the whole of the Syndicate's undertaking, to discharge its debts (£755), and to allot to the Syndicate or its nominees £15,000 fully-paid shares in the Company. The whole of the original capital was issued, including the £15,000. The principal part of the business of the Company was the lighting of omnibuses, for which contracts were entered into; and the failure of the concern was attributed to their unsuccessful termination. The shareholders were unanimously in favour of the Official Receiver continuing to act as Liquidator of the Company; and the Chairman intimated that this difference of opinion between the creditors and shareholders would be reported to the Court for settlement.

Charles Bright's Lighting Companies.

In the early part of the year, Alderman Smallman was engaged in a long investigation—extending over 22 sittings—of certain charges brought against Charles Bright, Joaquin Farmin Moreno, and Robert George Fudge, of conspiring together to commit certain misdemeanours, and to cheat and defraud the creditors of Charles Bright. The proceedings were noticed in the "JOURNAL" for the 6th of May (p. 1210); and it may be remembered that in the result, the case was sent for trial at the Central Criminal Court. It was there disposed of last Wednesday week by the Common Serjeant and a Jury. The circumstances of the case were as follows: The defendant Bright carried on an electrical business in Argentina. It was successful, and he subsequently obtained valuable concessions for the introduction of electric lighting at Buenos Ayres and for the construction of an electric tramway and an underground railway in that city. He afterwards came to London, and two Companies—named respectively Charles Bright and Co., Limited, and Bright's Light and Power Company, Limited—were formed to carry out the works. The defendant Fudge was a Director of the two Companies, and the defendant Moreno was the Secretary of one of them. Subsequently, two actions were brought against Bright in the High Court; and, eventually, in the course of last year, an application was made for a receiving order in bankruptcy against him. The bankruptcy proceedings were adjourned until November last. Bright gave notice to the Bankruptcy Court that in August he was going to South America in connection with his business there. Subsequently an affidavit was sworn in which it was stated that Bright had been seen in Boulogne, whereupon the bankruptcy proceedings were expedited, and Bright was adjudicated bankrupt. It now appeared that the statement in the affidavit that he had been seen at Boulogne on the very date

mentioned was inaccurate—a mistake being made in the date. Bright was at the time on his way to South America on board the steamer on which he had booked his passage. On his return from South America, he had to undergo a surgical operation in Paris; and when he had sufficiently recovered to be able to travel, he came to London and the prosecution was commenced. It was alleged by the prosecution that Bright concealed or did not disclose to his trustee in bankruptcy certain shares in Charles Bright and Co., Limited, and in Bright's Light and Power Company, Limited, which the prosecution contended belonged to him, and it was alleged that Fudge and Moreno had aided and abetted him in so doing. The defence was that the shares were not Bright's property, but belonged to certain of his friends, from whom he had received sums of money as capital when he started in business in Argentina, and that there was no ground whatever for the charge. The Jury said they were satisfied that no case had been made out against any of the defendants; and, the Common Serjeant agreeing with them, they were all declared to be not guilty. There was another indictment, on the same facts, charging the defendants with misdemeanours; but it was not proceeded with. The Jury declared them not guilty, and they were discharged.

Liability for Prepayment Meter Robberies.

A case of some importance to prepayment meter consumers was heard at Newport (Mon.) last week, when a man named M. W. Miller was sued by the Newport Gas Company for the recovery of £1 10s. 8d. for gas supplied. The amount of gas consumed was not disputed; but defendant contended that the money had been stolen from the penny-in-the slot meter after he had left the house, and therefore it was not fair to ask him to pay the amount again. The Bench, however, decided that the Company were entitled to recover. Mr. Davies (for the defendant): But we have paid it. The Chairman: The Company have not had it, and they are entitled to it. Judgment was given for the payment of the amount, with costs.

Embezzlement by a Gas-Works Clerk.

At the Birmingham Police Court last Wednesday, W. A. Woodward, aged 36, who had been for 23 years in the employ of the Birmingham Corporation Gas Department, was charged with stealing £5 2s. 10d. on Saturday, July 5. Mr. Reay Nadin, who prosecuted, said that latterly prisoner had held a position of trust as a counter clerk, and his salary had been raised to £130. It appeared that, in consequence of a notice requesting payment of a gas account being returned, endorsed by the debtor as paid, Woodward was sent for, and an explanation demanded. He could give no satisfactory answers; and while further enquiries were being made, he absconded. His till was then forced; and it was found that out of £18 taken in cash that morning £5 2s. 10d. was missing. Prisoner was subsequently arrested at Derby, and pleaded guilty. Mr. Baker, on Woodward's behalf, asked the Court to bear in mind that by this series of mistakes—or frauds—prisoner lost everything, including 23 years of real hard work towards his pension. A man who had been brought up in a department was very little use anywhere else, especially when he had no character; so that prisoner's punishment would be keen, apart from any sentence the Court might inflict. It was stated that the total defalcations amounted to just short of £70. The Stipendiary asked what motive prisoner had for the crime. Mr. Nadin said in prisoner's till were found a great many papers referring to transactions with money-lenders, including letters threatening prosecution. Mr. W. H. Powell, the Cashier of the Department, said there was no suspicion of any betting habits; but prisoner had been living beyond his means. The Stipendiary said he had taken everything into consideration; but could not inflict a lighter sentence than four months' imprisonment with hard labour.

Breaking a Gas-Meter.

At the Tipton Police Court on the 7th inst., a lad named Thomas Lappage was charged with wilfully damaging a gas-meter, to the amount of 10s. Mr. W. A. Foster, Solicitor to the Tipton District Council, who prosecuted, said the circumstances of the case were simple. On the 13th of June, Silas Underhill, a gas inspector in the employ of the Council, was doing his ordinary work at the house of the boy's father, and during his inspection he discovered that the meter had been tampered with. The money-box had been broken open by some sharp instrument, and 2s. 4d. extracted. The inspector made a complaint to the mother, who said she knew nothing about it. The meter (produced) was brought to the Police Station in its present state. The Bench would realize that this kind of thing was on the increase. Accused said he did not break open the meter, but stood by while two other boys did. Underhill stated that the register showed that 600 cubic feet of gas had been consumed. There was no money in the box, which had been forced open. Accused was fined 2s. 6d., and ordered to pay 10s. damages, and 8s. 6d. costs.

Electric Lighting in the City of London.—In the course of his annual report, the Electrical Engineer to the Corporation of London (Mr. A. A. Voysey) states, in regard to the public lighting, that the total number of arc lamps on Dec. 31, 1897, was 493; while on the same date in 1901 there were 508. The police reported 1306 failures, and Mr. Voysey 160, in 1897; while in 1901, 144 were reported by the former, and 133 by the latter. Whereas in the former year 24 group failures occurred, none took place last year. Mr. Voysey looks on these figures as indicative of a great improvement in the continuity of the public lighting.

MISCELLANEOUS NEWS.

THE LONDON COUNTY COUNCIL AND WATER GAS.

Suggested Legislation.

At the Meeting of the London County Council to-day, the Public Control Committee will present the following report on the subject of the supply of water gas in the Metropolis:—

The Council on July 30, 1901, authorized a communication to be sent to the President of the Board of Trade asking that the Government might be urged to take steps to promote legislation in the next session of Parliament to give effect to the recommendations of the Departmental Committee on water gas. The Departmental Committee suggested (*inter alia*) that the proportion of carbonic oxide in the public gas supply at night should be limited to 12 per cent., or such greater amount as a central department might consider desirable, and that provision should be made for testing the gas for carbonic oxide. A reply was received from the Board of Trade, dated Nov. 21, 1901, stating that the President would be prepared, if opportunity offered, to introduce a Bill to give some authority power to make the necessary regulations with regard to the supply of water gas; but up to the present time apparently no steps have been taken in the matter.

In accordance with the authority of the Council, the gas supplied in the county by the South Metropolitan Gas Company, the Gaslight and Coke Company, and the Commercial Gas Company has been continuously examined during the past twelve months with a view of ascertaining the quantity of water gas present; and we submit a report by the Council's Chemist on the subject, a copy of which has been sent to each member of the Council.

With regard to the gas supplied by the South Metropolitan Gas Company, though on a considerable number of days more carbonic oxide was present in the gas than is usually found in well-made coal gas, there was nothing to indicate the presence of water gas. The information obtained by the daily examination of the gas supplied by the Gaslight and Coke Company and the Commercial Gas Company was as follows—

1.—Of the samples taken in the district supplied by the Gaslight and Coke Company, 57 per cent. contained under 12 per cent. of carbonic oxide, and 94 per cent. contained under 16 per cent. of carbonic oxide.
2.—Generally there was very little difference in the quantity of carbonic oxide present in the gas supplied by the Gaslight and Coke Company to any one place on the same day; and the percentage was about the same during lighting and out of lighting hours.
3.—Of the samples collected in the area supplied by the Commercial Gas Company, 19 per cent contained less than 12 per cent. of carbonic oxide, and 76 per cent. contained less than 16 per cent. of carbonic oxide.
4.—When two samples were collected at the same place on any one day in the district supplied by the Commercial Gas Company, the percentage of carbonic oxide varied considerably; the larger quantity being usually found in the sample collected during the hours of lighting.

The danger connected with the admixture of water gas with illuminating gas arises from the fact that water gas contains from 40 to 50 per cent. by volume of poisonous carbonic oxide gas, and although coal gas itself contains about 6 per cent. of carbonic oxide, its poisonous nature would be very largely increased by the addition of water gas in unduly large proportion. We are of opinion that the whole amount of carbonic oxide present in such enriched gas, as it is supplied to London, should not at any time during the 24 hours exceed 14 per cent. by volume, more especially as the tests made by the Chemist prove that the Gas Companies are able to supply gas of the statutory illuminating power, even when the quantity of carbonic oxide in the gas does not exceed 12 per cent. We recommend "That a copy of the Chemist's report with regard to the amount of water gas found in the London gas supply be forwarded to the President of the Board of Trade, and that he be urged to give effect to the promise contained in his letter of Nov. 21, 1901, and to promote legislation in the matter in the session of 1303."

EUROPEAN GAS COMPANY, LIMITED.

The Annual General Meeting of this Company was held last Tuesday, at the London Offices, Finsbury House, Blomfield Street, E.C.—Mr. R. Hesketh Jones in the chair.

The Secretary and General Manager (Mr. W. Williams) read the notice convening the meeting, and also the following report of the Directors:—

The Directors have much pleasure in reporting that, after protracted negotiations, the contract with the Municipality of Amiens, which would have expired in 1914, has been extended twenty years—*i.e.*, until 1934. The average length of the Company's concessions is now 27½ years.

The prolongation of the Amiens treaty was secured by granting substantial reductions in the price of gas, with the result that, although the actual quantity of gas sold at that station shows an increase, the rental there naturally is less than during the previous year.

This reduction, coupled with a falling off in the consumption at Rouen and Bolbec, brings the increase at the other stations (where the sale of gas has made satisfactory progress) down to a net aggregate increase of ½ per cent. only.

The coal delivered during the year under review has been mainly at the old prices, so that the cost does not yet show any improvement; but the Company are now feeling the effect of the lower-priced contracts alluded to in

the last report, and the new contracts made this year are on still more favourable terms.

The revenue received from coke, tar, and sulphate has been less than during the preceding year. The extension of the treaty at Amiens, however, necessarily reduced the amount chargeable for the amortisement of capital, and the Board are able to recommend the payment of the usual dividend of 20s. per share on the fully-paid shares, and 15s. per share on those £7 10s. paid, less the interim dividend of 8s. and 6s. per share respectively, paid on Feb. 1 last. Also that a bonus of ½ per cent. be paid on all shares according to the amount paid thereon, subject, however, to a deduction for French stamp and transfer duty of 1s. 1d. per fully-paid share, and 10d. per share £7 10s. paid in respect of all shares held in France.

The Directors have to report with great regret the death of Mr. E. T. E. Besley, K.C., who had been a Director of the Company for eleven years. In his place, they have appointed H. E. Jones, Esq., C.E.

Notice has been given that two Directors (R. Hesketh Jones, Esq., and H. E. Jones, Esq.) and both Auditors (J. Reeson, Esq., and F. M. Fry, Esq.) retire from office at this meeting; but, all being eligible, they offer themselves for re-election.

The CHAIRMAN said it was with much pleasure that he rose to propose the adoption of the report read by the General Manager. Proceeding to review the work at the stations during the past year, he remarked that at Amiens, on the completion of the new treaty referred to in the report, a change in the management was arranged. M. Vacher, who entered the Company's service in 1868, and who, during the whole period of 33 years, had given every satisfaction to the Company, had become incapable of much physical exertion; and it was considered desirable to place the works under a younger man. M. Cros, who had been with the Company first at Nantes, and then as Sub-Manager at Havre, had in consequence been appointed to the charge of the works and business at Amiens; and the Directors had every confidence that, in younger hands, an improvement would be effected both in the manufacture and in the distribution of gas. M. Vacher retired on a pension on the 31st of March last. He was, however, residing in the town and would place his ripe experience at the disposal of his successor. At Bolbec, there had been a reduction of 2½ per cent. in the rental; the use of the electric light in the factories rendering it difficult to maintain the consumption of gas. Recently, however, the railway station had been lit with gas; and as the leakage had been reduced by 3¼ per cent., the working at this station might be considered satisfactory. At Boulogne, there was an increased rental of 5¾ per cent. As to Caen, the Directors were in treaty with the Municipality for the extension of the concession for an additional twelve years—viz., till 1941. The terms were: The Company to convert the remainder of the public lamps from the old-fashioned burners into incandescent lights; the price for public lights to be reduced 1 centime per cubic metre, the Company agreeing to extend their mains from time to time for further additions of public and private lighting; and the Municipality paying for the up-keep of the incandescent burners. This treaty only awaited the confirmation of the Prefect. Some of the lamps were altered in the spring; and when two of the Directors visited Caen last May, the appearance of the lamps was very satisfactory. At Havre, business had been very dull during the year under review. The rental, however, had increased 2½ per cent. A coke-conveyor, with gas-engine and a coke-crusher attached, was now in full working order; and from the saving effected in labour during the first six months of 1902, it would appear to be equal to about 6d. per ton of coals, or £1200 a year. Havre was the Company's principal station, and was ably managed by M. Gaston Gautier, whose ability as a Gas Engineer had been recently recognized by the members of the Société Technique du Gaz en France electing him on the Council of that body. At Nantes, there was an increased rental of 2½ per cent. The Manager at this station was very active in extending the use of gas in engines and other ways to meet the competition of the electricians. The gas-works being situate in the middle of the town, much credit was due to him for the attention he gave to the conduct of the works. In fact, on the recent visit of the Directors, they could scarcely realize that they were in a gas-works, as it was difficult to detect any effluvia of an objectionable character. At Rouen, owing to the loss of lighting in some of the factories there, the rental was reduced by 2 per cent. The Manager was a specialist in carbonizing, to which he gave great attention. At Rouen, the Company owned a large block of land on the Ile Lacroix—a short distance from the works; and not being able to procure a purchaser or a tenant for it, the Manager had suggested that the Company should build workmen's dwellings thereon. This proposal would in due course be carefully considered by the Board. It might turn out to be a good investment for some portion of the reserve fund. The balance-sheet needed but little explanation. The cash in hand and on deposit on March 31 was more than sufficient to pay the dividend and bonus. Having regard to the amount of the amortizement and insurance funds, to the fact that 46 per cent. of the amount was invested in convertible securities on March 31, and that, consequent on the extension of the Amiens treaty, the average length of the concessions was now 27½ years, the Board considered (after very carefully going into the question) that the yearly allocation to these funds might, with safety, be modified; and this had been done. The amount hitherto written off fittings and meters on hire had also been readjusted to a sum amply sufficient, in the opinion of the Directors, to amortize the capital invested therein, within a period less than the ordinary life of meters and fittings; and he might add that, since March 31, they had made an addition to the convertible securities. He mentioned this in order to assure the shareholders that the dividend and bonus recommended had been fully earned, and that the Directors believed the Company's future prospects justified them in assuming that they would be able to propose a similar division of profits next year. They had invested £12,038 in realizable securities during the past financial year; and at its close the total investment was £305,435. From this, and in conjunction with the recent and prospective extensions of the concessions, he thought the shareholders would come to the conclusion that they held good property, which had been carefully administered by his predecessors, to whom, and to their General Manager the thanks of the shareholders were due. He concluded by moving the adoption of the report and accounts.

Mr. N. E. B. GAREY seconded the motion, which was unanimously carried.

The proposals of the Directors regarding the dividend and bonus (as set forth in the report) were also adopted.

On the proposition of Mr. E. F. WHITE, seconded by Mr. GAREY, the Chairman (who was one of the Directors retiring) was then unanimously returned to his seat at the Board.

Mr. WHITE having moved, and Mr. H. C. SMITH having seconded, the re-election of Mr. H. E. Jones,

Mr. H. D. ELLIS remarked that, as this was the first occasion on which Mr. H. E. Jones had come before the proprietors for their suffrages since he was co-opted to the Board, he should like to express the great satisfaction which he was sure all the proprietors felt when they heard of the Board's choice of a successor to their late lamented friend Mr. Besley. No one knew better than he (Mr. Ellis) of Mr. Jones's ability, for he had worked with him (he was sorry for one reason to say it) for the past quarter-of-a-century. Mr. Jones's reputation was almost unrivalled; and his views on the matters which came before the Board would be of very great assistance.

The resolution having been heartily agreed to,

Mr. JONES, in responding at the request of the Chairman for both, said he should like to say that the farther he looked into the concerns of the Company, the more did he realize what an extremely sound and important undertaking it was. He had had the pleasure, under the guidance of the Chairman and the General Manager, of lately visiting the whole of the stations. He was familiar with two of them before; but seeing the rest was certainly a very great pleasure. He was very gratified to see such a fine property; and he was also impressed by the quality of the *personnel* of the officers—especially the chief officers who administered the Company's affairs at each of the stations. He was delighted to find such capable and energetic engineers, and men whose social and scientific characteristics were equal, if not superior, to those seen in this country. He was also interested in looking into the habits and customs of every town, in order to see how far the Company could there realize those developments of modern gas consumption with which we are so familiar on this side of the Channel. One ought not to jump to conclusions; and therefore he should not like to give, as a definitely formed opinion, any hasty conclusion derived from this one visit. However, he might go so far as to say that he thought the prospects of future prosperity were good; but he found a wide difference in the conditions and circumstances under which the Company's concerns had to be administered compared with this country—the habits of the people being somewhat different. He was also gratified to find that every officer he came across on the other side was a Frenchman. This showed a sound and prudent policy on the part of the Board in the past.

The Auditors (Messrs. J. Reeson and F. M. Fry) having been re-appointed,

The CHAIRMAN moved a vote of thanks to the General Manager and the officers and staffs both at home and abroad. He referred in very appreciative terms to their work, and confirmed all that Mr. Jones had said regarding the officials on the Continent.

Mr. GAREY seconded the motion, and it was heartily agreed to.

Mr. WILLIAMS having responded,

A similar compliment was paid to the Chairman and Directors, on the proposition of Mr. ARTHUR SKAIFE, seconded by Mr. R. S. GARDINER.

An acknowledgment of the compliment by the Chairman concluded the proceedings.

THE GAS-WORKS PURCHASE QUESTION AT CHARD.

An Adverse Vote.

A Meeting of the owners and ratepayers of Chard was held last Tuesday, to consider the proposal of the Town Council to purchase the undertaking of the Chard Gas Company, and to promote a Bill next session for the purpose of carrying on the supply of gas and electric light.

The Mayor (Alderman F. Harris Mitchell) presided, and among those supporting him on the platform was Mr. W. A. Valon, J.P., the engineering adviser to the Council in the matter. The Mayor reminded the audience that in 1876 the Corporation were in favour of purchasing the gas undertaking, but the ratepayers were not. Mr. Valon now advised them that the purchase under certain conditions would be a very good thing; and the Council were almost unanimously of the same opinion. They were not going to purchase at an exorbitant rate, but at a practical, businesslike valuation, and on conditions which would never be theirs again. As to electric lighting, the Corporation did not intend to rush into it; but they put a clause in the Bill to prevent a company coming in and cutting the ground from under their feet. The joint production of gas and electricity was being effected with great success in many municipal gas-works. They had now the chance of acquiring a very paying business under most favourable circumstances; and if they neglected the opportunity, they would have to pay at least 20 per cent. more for the undertaking. Mr. Valon, who was asked by the Mayor to answer the various observations, said that, as an engineer, he had advised a large number of corporations in the purchase of gas undertakings, and could not think of one that was doing badly. With regard to the cost of the property in the present case, it would be indiscreet to say anything; but the basis of the purchase would be the £800 profit which the Company had made during their last year's trading. The works would be bought on a proper valuation, and no more would be paid for them than they were worth. If the Company were allowed to continue, they would want interest for the capital they expended. Was it therefore not better for the ratepayers to find that capital? Under intelligent management, he did not think they need fear loss. On a vote being taken, there were found to be 30 in favour of the Council proceeding with the scheme, and 32 against. A poll was demanded.

THE SULPHATE OF AMMONIA COMMITTEE.

Annual Report.

The fifth annual report of the Executive Committee of the Sulphate of Ammonia Committee to the subscribers has been issued; and the following has been extracted:—

During the past season, 85 competitions were organized by Agricultural Societies, of which number 80 were carried out successfully. This only shows an increase of three completed competitions over the number carried out during the previous year. This year, however, promises to show a considerable increase over last season, as applications have been received from Societies to arrange 101 competitions for the Committee's prizes.

Of the Committee's report on the competitions for the season 1900, 50,000 copies were printed, of which number 10,000 were taken by subscribers for circulation in their respective districts. The balance, with the exception of about 5000 copies, which were held in reserve, were circulated throughout the United Kingdom. The reference in this report to the treatment of "finger and toe" in turnips, produced so many inquiries as to the best method of dealing with this disease, that Mr. Hunter was requested to write a special leaflet on the Dalmeny treatment. No less than 5000 copies of this leaflet were printed, of which upwards of 3000 copies have been sent to Agricultural Societies and other applicants.

As stated in the last annual report, the Committee were represented at the Glasgow International Exhibition, 1901; and this year they are exhibiting at the Cork International Exhibition. Mr. Francis T. Cotton, of the Alliance and Dublin Consumers' Gas Company, has kindly undertaken the superintendence of all details; and the Executive Committee desire to take this opportunity of thanking Mr. J. Magrath, of the Cork Gas Consumers' Company, for the valuable assistance he has rendered, and the time and trouble he has devoted to the interests of the Committee in connection with the exhibit.

During the past spring, numerous communications have been received from farmers and others, in different parts of the United Kingdom, complaining of the difficulty they have experienced in obtaining sulphate of ammonia. This has been particularly noticeable with regard to Ireland, where many growers, who, after reading the agricultural report, were anxious to give the fertilizer a trial, were unable to do so on account of the difficulty of obtaining supplies. Although this is undoubtedly an indication of the increased interest which agriculturists are taking in sulphate of ammonia, it is regrettable, as the Committee's efforts have been particularly directed to Ireland during the past year. Strong confirmation of this state of affairs comes from the Committee's representative at the Cork Exhibition, who has had a long and intimate experience of Irish farmers, and who, in his present capacity, is continually coming in contact with them.

The Committee again advertised during the first five months of the present year in the leading agricultural papers. With the exception of the agricultural report, and a reprint of 20,000 copies of both the special pamphlet and leaflet, prepared for the Glasgow Exhibition, the Committee have issued no new literature during the past financial year. The stock, however, is getting very low, and it will be necessary to prepare a fresh supply at an early date.

Three subscribers, with an aggregate output of about 270 tons per annum, have resigned their membership during the past financial year. The Executive Committee have, however, pleasure in reporting two important additions to the list of subscribers—viz., the Edinburgh and Leith Gas Commissioners and the Manchester Corporation Gas Department, who have recently become members. In addition to the above, the Malvern Urban District Council and the Scarborough Gas Company have joined the Committee.

The quantity of sulphate of ammonia represented by subscriptions received during the past twelve months shows an increase of 239 tons compared with that of the previous year; the quantities for the two periods being:

July, 1900, to June, 1901	. . . . .	118,174 tons
,, 1901 ,, 1902	. . . . .	118,413 ,,
Increase	. . . . .	239 tons

The Executive Committee much regret to announce the decease of Mr. W. R. Chester, late Engineer and Manager of the Nottingham Corporation Gas Department, who had been a member of the Executive Committee since the formation of the Committee in 1897.

Once more the agricultural competitions are the leading feature of the year's work; and the Executive Committee are confirmed in their previously expressed opinion that it is these competitions, and the more recently instituted grain and cattle feeding trials, to which they will have to look for promoting the interests they desire to serve.

THE WELSBACH COMPANY ADVISORY COMMITTEE.

Their Mission Fulfilled.

In last week's issue, we gave the main portion of the report of the Directors of the Welsbach Company, together with an extract from the accompanying circular of the Advisory Committee to the shareholders. As the latter document completes, as far as is possible, the history of the critical period through which the Company have been passing, it will be of interest to put it upon record:—

It will be within your recollection that, at the extraordinary general meeting of shareholders of the Welsbach Company held on Jan. 15 last, at which the report of the Advisory Committee was adopted, it was stated, on behalf of the Committee, "that they were prepared, in the interest of the shareholders of the Welsbach Company, to temporarily take over, with the assistance of Mr. H. L. Peters, the administration of the Company's affairs, for the purpose of creating a new Board;" and an appeal was thereupon made to the then Directors of the Company to facilitate the giving effect to the recommendation of the Advisory Committee, by resigning forthwith, and electing in their place the Advisory Committee and Mr. Peters as a Provisional Board, until such time as the services of a definite Board of Directors should be secured. This proposal was not immediately acquiesced in by the Directors. But a few days later, the Committee were approached by Sir Henry Burdett and his colleagues, and, eventually, satisfactory terms were arranged, under which these gentlemen retired, and in their place there were elected five members of the Advisory Committee as a Provisional Board, who, together with their other colleagues of the Committee and Mr. Peters, co-operating in a consultative capacity, at once took over the administration of the Company's affairs, and initiated the policy advocated in their report.

The primary object of the Provisional Board was necessarily the selection of a definitive one—a matter requiring great deliberation and care, in order to obtain the services of gentlemen of the highest reputation and business efficiency; and it has been a matter of profound satisfaction to his colleagues that Mr. Edgar Williamson, whose great abilities and special fitness for the post are unquestioned, eventually yielded to their unanimous representations, and agreed to accept, temporarily at all events, the chairmanship of the Company. The variety and urgency of complicated legal questions affecting the Company's interests, which required careful treatment, rendered desirable the appointment of a trained lawyer of wide experience as a member of the Board; and the election of Mr. Mattinson, K.C., to the position of Vice-Chairman will readily commend itself to the proprietors. In Mr. T. J. Brinsmead, late Managing-Partner of the firm of Messrs. Brinsmead and Sons, the Committee have been fortunate in securing a gentleman of recognized business capacity, and of prolonged experience in the management of factories; while Mr. W. W. Wright, Chartered Accountant, who acted as Secretary to the Committee, and thereby gained an intimate acquaintance with the Company's affairs, was peculiarly qualified to afford special service to the Company in the conduct of its commercial departments. The selection of a gentleman to fill the remaining vacancy upon the Board is under consideration.

The Advisory Committee consider that their mission has now been fulfilled. In one particular alone, it may be desirable that the Committee should still offer their assistance, when the question of the reduction of capital, as recommended in their report, has to be finally determined; for it is probable that the co-operation of the Committee, acting impartially on behalf of all classes of shareholders, may be of advantage to the Directors, as well as to the proprietors, and, in the course of the ensuing financial year, it would appear to be urgent that this very difficult problem should be resolutely faced, and, if possible, brought to a satisfactory conclusion. The Committee have to thank the proprietors for the cordial support which they have constantly received from them in the execution of their responsible duties during the past twelve months.

[The circular is signed by the Hon. Philip Stanhope, Mr. Thomas J. Barratt, Mr. H. L. Peters, Mr. Francis J. Russell, Mr. George A. Touch, and Mr. William Whiteley.]

GLASGOW GAS AND ELECTRICITY SUPPLY.

Application for Further Powers.

Under the provisions of the Private Legislation Procedure (Scotland) Act, 1899, the Glasgow Corporation have applied to the Secretary for Scotland (Lord Balfour of Burleigh) for authority to acquire the undertaking of the Milngavie Gas Company and for additional powers in respect of their gas and electricity undertakings. The Bill to confirm the Provisional Order granting the powers sought left the House of Lords on Monday last week, and was read the third time in the Commons on Friday; so that the Corporation are safe. The following is an outline of the contents of the Order.

The preamble sets forth that by the Glasgow Corporation Gas Acts, 1869 to 1901, the Corporation were authorized to supply gas to the city and suburbs, and other places intermediate and adjacent; and that by the Glasgow Corporation (Partick, Hillhead, and Maryhill) Gas Act, 1891, the area for the supply of gas was divided into two districts, called respectively "the city supply district" and "the supplementary supply district." The Corporation have agreed to acquire the undertaking of the Milngavie Gaslight Company, and they ask that the agreement for such acquisition, contained in the schedule to the Order, should be confirmed, and the area for the supply of gas extended so as to embrace the district hitherto supplied by the Company, as well as other districts, and that these should be added to the supplementary supply district already mentioned. The Corporation also wish to have further powers conferred on them with reference to their gas and electricity undertakings, and likewise to be authorized to borrow more money for the purposes and in the specified manner.

The Order is divided into four parts—the first being preliminary, the second relating to gas, the third to finances, and the fourth to miscellaneous matters. The first part does not call for notice. In the second, it is set forth that from and after the passing of the Act confirming the Order, the supplementary supply district, as defined by section 3 of the Act of 1891, shall be extended so as to include so much of the parish of New Kilpatrick, in the county of Dunbarton, and of the parishes of Strathblane and Baldernock, in the county of Stirling, as is comprehended within the area defined on a plan signed by the Secretary for Scotland. While the price to be charged by the Corporation for gas sold by meter within the city district is, under section 9 of the Glasgow Gas Act, 1882, to be charged equally to all consumers within that district, the Corporation may, within the defined area, and notwithstanding anything contained in that Act, charge a differential rate for the gas supplied by meter and for public lamps; but it shall not

(unless otherwise duly authorized) at any time exceed the maximum price of 4s. 7d. per 1000 cubic feet fixed by section 67 of the Corporation's Act of 1869.

The agreement between the Milngavie Company and the Corporation is sanctioned and confirmed. In conformity therewith, the Directors of the Company are authorized to execute a deed of conveyance vesting the undertaking in the Corporation, and to grant all other deeds or documents that may be necessary to carry the agreement into effect. On the delivery to the Corporation of the deed of conveyance, they are to pay the price agreed upon for the concern, which will thereupon be vested in the Corporation, and carried on by them as part of their undertaking; and the Company will be wound up. In the event of the Corporation at any time deeming it inexpedient to retain the ground and works which belonged to the Company, they are authorized to sell and dispose of them. No penalty is to be incurred by the Corporation for neglect or refusal to furnish a supply of gas in accordance with the provisions of the Gas Acts, or for insufficiency of pressure, defect of illuminating power, or excess of impurity in the gas in any case in respect of which the Court having cognizance of the matter are of opinion that such neglect, refusal, insufficiency, defect, or excess was caused by circumstances beyond the control of the Corporation, or was of so slight or unimportant a character as not materially to affect the value of the supply.

In the third part of the Order, the first paragraph confers power on the Corporation to borrow on bills or promissory notes £500,000 more than the sum specified in section 48 of the Act of 1899; making the total £1,000,000. The Corporation are also granted an extension of borrowing powers for the purposes of the Municipal Buildings Act

Among the miscellaneous provisions contained in the Order are two in relation to the electric light undertaking of the Corporation. The first specifies that, notwithstanding anything contained in the Corporation's Electric Lighting Order of 1890, or any other that may be granted to them during the session of 1902 for the supply of electrical energy, or in the Electric Lighting Acts, 1882 and 1888, a person shall not be entitled to demand from the Corporation a stand-by supply of electrical energy to premises having a separate supply, unless he shall have previously agreed to pay to the Corporation such minimum annual sum as will give them, for such period as may be agreed, a reasonable return on the capital expenditure and other standing charges incurred by the Corporation to meet the possible maximum demand of such person. In case the Corporation and the person demanding such supply of energy fail to agree as to the amount of the minimum annual sum and the period for which it shall be paid, it is to be fixed by an arbiter to be appointed by the Sheriff on the application of either party. The other provision sets forth that the Corporation may, within their area for the supply of electrical energy, provide, sell, let on hire, and fix up, alter, repair, and remove (but not manufacture) lamps, meters, motors, electric lines, fittings, and apparatus necessary or proper for the supply, distribution, consumption, or use of electrical energy for heating and motive power, and may provide all materials and do all work necessary or proper in that behalf, and may require and take such remuneration as they think fit, or as may be agreed upon between them and the parties concerned. It is provided that no lamp, meter, motor, fitting, electric line, or other appliance belonging to the Corporation, shall be subject to the landlord's hypothec for rent, or be liable to be taken in execution under any diligence or process of any Court or any proceedings in *cessio* or bankruptcy against the person in whose possession the same may be, provided it bears upon it a distinguishing metal plate affixed to a conspicuous part, or a brand or other mark impressed or made thereon, sufficiently indicating the Corporation as actual owners.

THE PLYMOUTH GAS COMPANY AND THEIR EMPLOYEES.

Cordial Relations—Insurance of the Workmen.

Ample evidence was afforded last week of the cordial relations existing between the Directors of the Plymouth and Stonehouse Gas Company and their employees, on the occasion of their annual outing. As in the two previous years, the expense was borne by the Company; and the most ample provision was made for the comfort and enjoyment of all present. In order that the works might be carried on without interruption, the workpeople were divided into three parties, each consisting, with friends, of about 170. The programme on each day was the same. The party assembled in the Guildhall Square, and were driven in ten gaily decorated vehicles first to Callington, where dinner was served, then to Tavistock, where they were provided with tea, and finally to Plymouth. On Tuesday the party was accompanied by Mr. J. A. Bellamy, the Mayor of Plymouth and Chairman of the Company; on Wednesday, by Mr. T. Wolferstan and Mr. H. S. Wilcocks, Directors; and on Thursday, by Mr. A. S. Harris, another Director, and Mr. Wilcocks. Mr. P. S. Hoyte, the Engineer and Manager of the Company, who made the arrangements for the excursions, accompanied all the parties. The weather on each day was fine; and the long drives in the beautiful scenery of the neighbourhood were much enjoyed. At the dinner on Tuesday, Mr. J. Walters, foreman of the carbonizing department, proposed the health of the Chairman, and cordially thanked him and his co-Directors for providing the treat. Mr. G. H. Bending, of the distribution department, supported the toast, and said the outdoor section of the Company's employees greatly appreciated the kindness of the Directors. The Chairman, in the course of his reply, said he could confirm what he said at the annual meeting of the Company—namely, that he felt absolutely satisfied with the year's work and with the pleasant relations existing between the Directors and the employees. He knew that no concern could succeed unless the relations between the directing body and the men were cordial, and they had confidence in one another. The Plymouth Company had a first-class set of men, who were willing to put their best work into what had to be done for the general prosperity; and, so far as he had been able, he had tried to render their position comfortable, and to make them understand that there was a fellow-feeling among them. The Directors had considered the question of compensation to workmen for injuries by accident, and had come to the conclusion that the Compensation Act did not cover all that was intended. It appeared to them to be absurd that the law should contemplate the compensation of a man injured at the works, and not of one injured while doing the Company's work in the street. They thought that if a man sustained an injury while in the employ of the Company, he ought to be compensated. They had accordingly insured the whole of the workmen against accident. The concern was holding its own, notwithstanding the competition brought against it; and he hoped at no distant date to see the price of gas further reduced in Plymouth. The Directors had made up their minds that if they succeeded in this, and so "broke the record" in the matter of the price of gas in Plymouth, the men who assisted in achieving this result should have a share of the extra profit earned. Anything that could be reasonably done by the Directors to add to the comfort of the men or improve the conditions of their employment would be carried out. Mr. J. H. S. May (a Director) and Mr. Hoyte, for both of whom loud calls were made, also made short speeches. Mr. Hoyte said that of late years the relations between the Company and their workpeople had much improved. Ten years ago there was constant bickering. To-day there was none, because, as he believed, the workpeople had nothing to complain of, and also because they knew they could go straight to the Engineer or the Directors and be treated with perfect fairness as between man and man. On the other days the Directors were thanked in cordial terms by those who took part in the excursions.

GREENOCK GAS AFFAIRS.

At a recent Meeting of the Greenock Corporation Gas Committee, there was some discussion as to the alterations and improvements that are going forward at the Inchgreen Gas-Works, with the view of increasing the make and improving the quality of the gas supply. Mr. Morrison said that if the proposed improvements were carried out, it would not be necessary to extend the retorts to the north for the next ten or twelve years. But in the monthly report of the Manager (Mr. W. Ewing) submitted to the meeting, a flat contradiction was given to Mr. Morrison, as Mr. Ewing recommended the renewing of the remainder of the old retort settings on the ground floor with generator settings, similar to those at present in use, so as to make ample provision for the maximum make of gas during next winter, at a probable cost of £9 per mouthpiece. This recommendation seems to indicate that the alterations and improvements now going on will not be quite so satisfactory as Mr. Morrison predicts. Mr. Ewing's recommendation came up for approval at the meeting of the Corporation last Tuesday, when he reported that during the month of June the quantity of gas made was 11,458,200 cubic feet, against 11,553,400 cubic feet in the corresponding month of last year, being a decrease of 95,200 cubic feet; and that the average make per ton of coal was 10,267 cubic feet. The gas sent out was 11,250,200 cubic feet, against 11,144,400 cubic feet last year, or an increase of 115,800 cubic feet. The quantity of coals used was 1116 tons, against 1263 tons. The quantity received amounted to 1306 tons, against 1276 tons; and the stock was 2456 tons, against 3137 tons. Mr. Morrison, in moving the adoption of the Gas Committee's minutes, said that the principal business was a recommendation with regard to the purchase of 27,880 tons of coal at an average price of 12s. 2d. per ton, compared with 13s. 10d. last year. This would mean a saving of £2200. Mr. Shearer seconded the motion. Mr. Mitchell said he must move an amendment. What he wished to refer to particularly was the question of coal used during the past month. In August last year, he complained that there was a mistake of 480 tons in the quantity of coal in stock, compared with that received and that consumed. He had now to complain that the 480 tons had increased to 900 tons. In the May minutes, he found that the quantity of coal used for the eleven months was 31,173 tons, and now the Manager reported that he had used 1116 tons. That made 32,289 tons altogether. But when he came to the summary of coal used, he found 31,389 tons stated. In other words, if the Manager had a surplus in stock of 2456 tons, he could only have used 216 tons in June out of which to make more than 11 million cubic feet of gas, which was absurd. After some further observations and statistics, Mr. Mitchell moved that the minutes be sent to a Special Committee for investigation, and report before the next meeting of the Corporation. The amendment did not, however, find a seconder. The Provost expressed regret that Mr. Mitchell did not give his reasons for dissent at the meeting of the Committee. He knew perfectly well that they had discussed the 900 tons of coal, and asked the Manager to carefully consider the question and prepare a statement, in order to satisfy them on this important detail. Until the Manager had given them that report, it was scarcely judicious on their part to move any further. They should regard it as all right until they were satisfied that it was all wrong. Mr. Morrison said he did not dispute Mr. Mitchell's figures—in fact, he himself drew attention to the report in Committee; but until the Manager's explanation was received they ought to defer discussion. The minutes were passed.

According to a correspondent of the "Financial News," writing from Frankfort on the 16th inst., about three years ago a German concern was founded at Mannheim, with the object of breaking down the Russo-German Naphtha Import Company. The new undertaking had a refinery at Baku, and was closely connected with one of the most important Russian petroleum firms at Lodz. The latter having come to grief, owing to unsuccessful speculation, its ally at Mannheim could no longer stand alone; so that its winding up was inevitable. Through the agency of a Berlin bank, it has now been sold, together with the tanks at Hamburg, to an Anglo-German Syndicate, who intend to raise from the *débris* a new company; but whether it will be an English or a German limited liability concern has not yet been decided upon. The capital originally invested in the Mannheim firm is estimated at £250,000.

CATON WATER-WORKS PURCHASE ARBITRATION.

The Award.

The award of Mr. R. E. Middleton in the arbitration held last month to determine the value of the Caton Water-Works, near Lancaster, for the purpose of their transfer to the Lunesdale District Council (the proceedings in which were reported in the JOURNAL for the 8th inst., p. 105) has just been issued. For the Company, Mr. E. K. Burstal valued the undertaking at £10,728, and Mr. G. R. Strachan at £10,510. On behalf of the Local Authority, Mr. T. Fenwick contended that the concern was worth only £7380, and Mr. E. P. Hill valued it at £8042. The Arbitrator has fixed £10,396 15s. as the price to be paid.

NORTH PEMBROKESHIRE GAS AND WATER ARBITRATION.

Surveyors' Institution.—July 8, 9, and 10.

This was an arbitration for the purpose of determining the amount to be paid by the North Pembrokeshire Gas and Water Company for the compulsory taking of a portion of the building land belonging to the Pembrokeshire Estates Company, known as Windy Hall No. 2, situated between Goodwick and Fishguard, North Pembrokeshire, and for the injurious affection of the remainder of Windy Hall No. 2, and also Windy Hall No. 1.

Mr. THOMAS JONES was Arbitrator for the Estates Company, and Mr. FRANCIS for the Gas Company; and Mr. DUDLEY DRUMMOND acted as Umpire. Mr. REGINALD NEVILLE (instructed by Messrs. Radcliffe, Cator, and Hood) appeared for the Estates Company; and Mr. WEDDERBURN, K.C., and Mr. VESEY KNOX (instructed by Messrs. Baker, Lees, and Co.) represented the Gas Company.

Evidence was called on behalf of the Estates Company to show that Fishguard would become a favourite watering-place, the railway now being opened to Goodwick, which would probably develop as a commercial port in connection with the American and Irish trade. The Company's land would thereby become greatly appreciated in value, but for the fact of the gas-works, which, it was stated, were at the very entrance to the property—between the railway and the sea. The witnesses for the Gas Company practically valued the estates as mere agricultural land, contending that it would be many years, if at all, before building operations would become desirable. The amount claimed for land taken was £1070, and £1400 for injurious affection—making a total claim of £2470.

Mr. WEDDERBURN, on behalf of the Gas Company, raised an interesting legal point in the case. It appeared that originally the Estates Company owned Windy Hall No. 1 only, and that No. 2, on which the gas-works are to be erected, was purchased by them, as to two-thirds of it, after the usual parliamentary notices of the Bill had been sent to them (in accordance with the Standing Orders of the House), and the remaining third after the Bill and after the notice to treat. The parliamentary notice was rendered necessary, in connection with Windy Hall No. 1, by the fact that one house erected on the estate was within the 300 yards limit of the proposed gas-works site. It was pointed out by Counsel that, as the law stands, no claim for injurious affection could have arisen with regard to Windy Hall No. 1 unless it had been in the same ownership as No. 2. The parliamentary notice was merely for the purpose of giving those owners affected the option of opposing a Bill in Parliament, to prevent its passing; but it did not imply that compensation could be asked for. As a fact, it could not. The only people who could get compensation in respect to lands not taken were those owners who were also the owners of the gas site; the expression in the Lands Clauses Consolidation Act being "lands held with" the gas lands. At the time of the parliamentary notice, Windy Hall No. 2 and Windy Hall No. 1 were in separate ownerships; and Counsel therefore asked the Umpire to find as a factor that No. 1 was not "held with" No. 2, and as a consequence, that no claim for injurious affection could arise in regard to it. He quoted an instance known as the Bishop of London's case, reported in I. Simon's and Stewart, 268, in which the direction of the Recorder of London of that day to the Jury was perfectly clear—viz., that they were to disregard certain claims, because the leases in respect to which they had been made were dated after the passing of the Private Act of Parliament. Counsel admitted that the case was in 1818, before the Lands Clauses Consolidation Act had been passed; but that did not alter the principle. He pointed out that it would be a great hardship on promoters if his contention were not sound. They might select a certain site because of the fact that the owner of the land had very little or no adjoining property. If after the parliamentary notice of the Bill, people were permitted to change the ownership, the promoters would be seriously affected. He did not allege that the Estates Company purchased Windy Hall No. 2 for the purpose of being able to claim injurious affection for Windy Hall No. 1, nor did he deny the statement of Mr. Remnant—the Chairman of the Company—that as a fact, although no doubt the Secretary had had notice (which was sufficient according to law), as appeared from the documents proved by the Parliamentary Agent (Mr. Baker), yet neither he nor any other of the Directors, nor the Secretary himself, had any recollection of having received it. But the effect of their having purchased Windy Hall No. 2 was that it gave the Estates Company power to ask for compensation for the injurious affection of Windy Hall No. 1, which otherwise they could not have done. He, however, contended that as the purchase was commenced after the parliamentary notice, and completed after the notice to treat (the ownership having been in separate hands at that time), Windy Hall No. 1 could not be alleged to be "held with" Windy Hall No. 2, as the Lands Clauses Consolidation Act prescribed.

The facts were, shortly, these: In 1896, the Estates Company bought Windy Hall No. 1 which was always a separate property from No. 2. In 1898, the Gas Company proposed to take a portion of No. 2 for their site, and served their parliamentary notice upon the Estates Company with regard to No. 1—a part of which was within the 300 yards radius—in order to give them an opportunity to oppose the Bill. The Estates Company decided not to oppose. In April, 1899, they started to buy No. 2, probably without any idea of any claim for injurious affection which they were now raising. No. 2 was held in undivided thirds; and the Estates Company purchased two-thirds in 1899. It was not till 1901, however, that the last third was purchased; the Gas Company's Bill having been passed in 1899, and a further Bill for extension of time being passed in 1900. Thus the Estates Company did not become the complete owners until 1901—after the Bill was passed. The reason given by Mr. Neville for the non-completion of the purchase, which was not denied by Mr. Wedderburn, was that the heirs at-law of the owner of No. 2 were scattered all over the world. The evidence given by Mr. Jenkinson, the Secretary of the Estates Company, to the effect that the Company were in treaty for No. 2 long before the notice to treat, was also not denied by the other side. Mr. Neville contended that, but for their inability to deal with the outstanding interests, No. 2 would have been absolutely their property before the parliamentary notices of the Bill with regard to No. 1 were served. Mr. Wedderburn asked the Arbitrator to state a special case, and to find as a fact that Windy Hall No. 1 was a separate holding. What the legal position was might then be determined hereafter. The five things he asked to be stated separately were as follows: (1) The value of the land taken (part of Windy Hall No. 2). (2) Whether the remainder of No. 2 had been depreciated at all; and, if so, by what amount. (3) Whether Windy Hall No. 1 was depreciated at all; and, if so, by what amount. (4) That the Estates Company bought Windy Hall No. 2 with full notice of the Gas Company's Act. (5) That Windy Hall No. 1 was not "held with" No. 2, but was an altogether separate holding.

The UMPIRE asked the nature of the application with regard to the special case.

Mr. WEDDERBURN said that if any injurious affection of Windy Hall No. 1 were found, he asked that the award might be given in the form of a special case, in order that the question might be raised hereafter as to whether the Estates Company could alter the position of matters after the passing of the Act of Parliament.

The UMPIRE said Counsel had a right to ask him to state a special case on questions of law, but not on questions of fact.

Mr. WEDDERBURN pointed out that, in order that he might be enabled to raise the question of law, certain facts must be found by the Umpire. If no injurious affection of Windy Hall No. 1 were found, and if it were also found that Windy Hall No. 1 was not "held with" Windy Hall No. 2, then it would not be necessary to state a special case at all.

The remainder of the Counsel's speech dealt with the value of the estates as building land. He ridiculed the idea that the place could ever become, as described, a "favorite seaside resort"—or, at least, not for many years to come.

Mr. NEVILLE, in replying on behalf of the Estates Company, referring to the point of law, said that the Umpire was to assess compensation under section 63 of the Lands Clauses Consolidation Act; and there were no such words in that as "lands held with." The words were that the arbitrator was to find the damage (if any) to be sustained by the owner of the lands "by reason of the severing of the lands taken from the other lands of such owner, or injuriously affecting such other lands by the exercise of the powers of this or the Special Act." What had been laid down again and again in cases arising under the Lands Clauses Consolidation Act in the most authoritative language was that there could be no change *after the date of the notice to treat*. The notice to treat was the thing which bound the land. But in the case of the notices of the Bill, everybody knew that a Bill might be thrown out, or that the capital might not be raised, and therefore that did not bind the land in any way. He challenged his learned friends to cite a case under the Lands Clauses Consolidation Act where it had been decided that the notice given for any Bill affecting property could prevent people from dealing with it. There was no such case. Counsel also quoted from the book dealing with the Lands Clauses Consolidation Act by Mr. Balfour Browne, which stated: "In order that damages may arise from severance, it is not necessary that the land should be held under the same title for the same estate or for the same purpose. It is enough if both parcels of land are held by one and the same owner." In the present case, he contended the lands were held under the same title, and there was the same ownership. It was clear, from the evidence given on behalf of the Estates Company, that the purchase of Windy Hall No. 2 was *bonâ fide*; it was vital to their interests in connection with Windy Hall No. 1 that they should have the control of the class of buildings to be erected on Windy Hall No. 2. The facts in the case were that the Estates Company acquired No. 2, as to two of the undivided thirds in which it was held, before the 1899 Bill was passed; so that, at all events, they had an interest in the land. The last third could not be acquired at that time, because the Trustees and heirs-at-law of the former owner were scattered all over the world. But it was not necessary to have the whole interest in the land, as in that case a leaseholder or a mortgagee could get no compensation. It was only necessary to show what interest one had; and in 1899, when the Gas Company's Act was passed, the Estates Company had two-thirds interest in the land. Subsequently, in April, 1901, the Estates Company obtained the whole interest. He asked the Arbitrator to find as a fact that the purchase was made by the Estates Company, without any reference whatever to any question of compensation by the Gas Company being payable for taking the land in question. *Higgins v. Mayor of Dublin* (28 L.R., Ir. Q.B., 484) laid it down that, even if certain things were done after notice of the Act, the owners were entitled to receive compensation. It was reported, on page 42 of Mr. Balfour Browne's book: "The owner of certain dilapidated houses, while putting them into repair, was informed that a Provisional Order had been obtained enabling the corporation of the city to acquire them compulsorily"—that was the position (if any) taken up by Mr. Wedderburn—"and that the Order was about to be confirmed by Act of Parliament. He continued his repairs and refused to stop; and, upon a case stated, the Court were of opinion that he was entitled to the sum

expended thereon, and that the Judge's instruction to the Jury—that if they considered the owner's outlay as repairs not *bonâ fide*, but for the purpose of making an inflated claim for compensation they should disallow it—was wrong."

Mr. VESEY KNOX said it did not appear that there had been anything that was claimed for done after the passing of the Act.

Mr. NEVILLE said he did not know that it did not; but at any rate he had dealt with the passing of the Act. He asked the Arbitrator to say it was a *bonâ fide* purchase for the Estates Company's benefit, and for the purpose of developing their estate. As to a further point raised by Mr. Welderburn, that the presence of the Gas Company would help to develop the estates of the Company, that was dealt with most distinctly on page 121 of Mr. Balfour Browne's work: "There is no provision in the Lands Clauses Act allowing promoters to set-off against the owner's claim for compensation for severance or other injurious affection, that the value of the land will be enhanced by reason of the land taken by the promoters."

Mr. VESEY KNOX read a subsequent paragraph, as follows: "As the future use of the land may be taken into account in estimating the damage by severance and by other injurious affection of the land belonging to the same owner not taken (*Essex v. Acton Local Board*, 14 A.C., 153), it would appear that if the value of such land is enhanced by the future use of the land taken, the damage may in such cases be *nil*."

Mr. NEVILLE then proceeded to contend that the property of the Estates Company would in a short time be greatly developed and exceedingly valuable, except to the extent that it would be depreciated by the erection of the gas-works at the entrance to the estates, between the railway station and the sea. It was quite clear, he said, that the Legislature understood that a gas company's works were likely to be a nuisance, inasmuch as they had passed a Standing Order to the effect that all people who had owned houses within a certain distance of the proposed site should be served with notice. He asked the Arbitrator to state in the special case, that at the date of the notice to treat both Windy Hall No. 1 and No. 2 were in the ownership of the Estates Company, and that the interest which the Gas Company took at that date was in them at the time. That was perfectly sufficient to entitle the Estates Company to get compensation for injurious affection.

This concluded the inquiry; the Umpire stating that he would make his award in due course.

THE STEPNEY ELECTRIC LIGHT UNDERTAKING.

The unsatisfactory position of the above-named undertaking was shown in a paragraph which appeared in our "Electric Lighting Notes" last week. It was based, it may be remembered, upon a special article in the "East London Observer," and as the writer goes fully into the position of the concern, as revealed by the recently published accounts, some extracts may prove interesting.

The first electric lighting to be undertaken in the eastern portion of the Metropolis was that of Shoreditch. Whitechapel followed; the old District Board of Works having obtained in 1892 an Electric Lighting Order. Limehouse, Mile End, and St. George's-in-the-East—the other component factors of the borough of Stepney—obtained their Orders nine years later. In the last three cases, a private Company obtained an Order, which, however, was not put into operation, although under a recent arbitration the local authority have to pay £5000 to compensate the Company for the non-exercise of their rights. Whether this £5000 and the costs of arbitration will be made a charge upon the electric lighting installation of the entire borough, remains to be seen. Inasmuch, however, as the award has to be made upon St. George's, Mile End, and Limehouse, Whitechapel, was not concerned in the matter at all, it is difficult to see how this can be equitably done. At the same time, were it so charged, it would seriously affect the financial position of the undertaking. The accounts are issued separately, the first for fifteen months ending March 31, 1901, and the second from March 31, 1901, to March 31, 1902, apparently covering the whole period during which the Whitechapel installation has been in progress. These accounts are much belated. They have frequently been called for in the columns of the local Press; and no satisfactory explanation has been forthcoming as to the reason of the delay. It is to be observed in the accounts, however, that the first are endorsed "Audited and approved April 9, 1902." The accounts were submitted to the Committee on the 12th of June, and ordered to be printed. Those for the twelve months ending March, 1902, have still to be audited.

Dealing with the accounts for the fifteen months, the capital raised was £79,000, of which only £169 has been repaid. All the money has been spent except £859 – £1369 being paid as fees to the Consulting Engineer (Mr. A. Wright). Turning to the revenue account, the cost of generation for the fifteen months amounted to £5767. All that was spent in repairs or renewals was £53 16s. 7d. The receipts amounted to £6347; but this includes £1494 for public lighting, the amount sold to the ordinary consumers being £4065. To the cost of public lighting has to be added £625 for repairing arcs. The difference between the expenditure and the revenue was £579 to the good; this amount being available for meeting loan charges and depreciation. Turning to the net revenue account, the expenditure on capital account is £2518, £169 is the first instalment of repaid capital, and £771 is for a temporary building—making £3458. Against this there was to be set only the balance of £579 with a few other amounts; the total result of the first fifteen months' working being a loss of £2743 8s. 3d.

That is bad for the revenue account; but taking the statement of assets and liabilities, the position is worse. The liabilities amounted to £91,056; and all the assets being reckoned at their full purchase price, without any allowance for depreciation, there was a deficiency of assets over liabilities of £2574. Of course, this is plainly set out in the accounts, and a special memorandum draws attention to the loss.

GAS AND WATER COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 208.

Issue.	Share.	When ex-Dividend.	Dividend or Interest & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.	GAS COMPANIES.			£ s. d.
590,000	10	Apl. 11	10½	Alliance & Dublin 10 p.c.	18—19	..	5 10 6
100,000	10	,,	7½	Do. 7 p.c.	13—14	..	5 7 2
300,000	100	July 1	5	Australian 5 p.c. Deb. .	100—102	..	4 18 0
200,000	5	May 14	6½	Bombay, Ltd. . . .	6—6¼	..	5 0 0
40,000	5	,,	6½	Do. New, £4 paid	4¼—4⅝	..	5 9 5
380,000	Stk.	Feb. 13	12	Brentford Consolidated	255—260	..	4 12 4
270,000	,,	,,	9	Do. New . . .	189—194	..	4 12 9
50,000	,,	,,	5	Do. 5 p.c. Pref. .	128—133	..	3 15 2
206,250	,,	June 17	4	Do. 4 p.c. Deb. .	111—114	..	3 10 2
220,000	Stk.	Mar. 13	10	Brighton & Hove Orig.	205—210	..	4 15 3
246,320	,,	,,	7	Do. A. Ord. Stk. .	148—153	..	4 11 6
410,000	20	Apl. 11	10	British.	39—41	..	4 17 7
50,000	10	Feb. 13	12	Bromley, Ord. 10 p.c. .	23—25	..	4 16 0
82,850	10	,,	9	Do. 7 p.c. . . .	18—20	..	4 10 0
500,000	10	May 14	7	Buenos Ayres (New) Ltd.	10—11	+½	6 7 3
253,000	Stk.	June 24	4	Do. 4 p.c. Deb.	94—96	..	4 3 4
150,000	20	July 11	8½	Cagliari, Ltd. . . .	21—23*	..	7 3 6
100,000	10	June 12	10	Cape Town & Dis., Ltd.	15—16	..	6 5 0
50,000	50	May 2	6	Do. 6 p.c. 1st Mort.	54—56	..	5 7 2
550,000	Stk.	Apl. 11	12	Commercial Old Stock	265—270	..	4 8 11
251,875	,,	,,	9	Do. New do. .	205—210	..	4 5 9
271,875	,,	June 12	4½	Do. 4½ p.c. Deb.	130—134	..	3 7 2
800,000	Stk.	May 28	8	Continental Union, Ltd.	138—143	..	5 11 11
200,000	,,	,,	7	Do. 7 p.c. Pref.	147—152	..	4 12 1
575,000	Stk.	Feb. 27	5	Crystal Palace Ord. 5 p.c.	120—125	..	4 0 0
60,000	,,	,,	5	Do. 5 p.c. Pref. .	122—127	..	3 18 9
91,140	,,	July 11	5	Do. 5 p.c. Deb. Stk.	139—142*	+1	3 10 5
436,090	10	Jan. 30	10½	European, Ltd. . . .	19—20	..	5 5 0
354,060	10	,,	10½	Do. £7 10s. paid	14—15	..	5 5 0
15,253,200	Stk.	Feb. 13	4†	Gas-light and Coke	4 p.c. Ord. . .	90—92	−4	4 7 0
2,600,000	,,	,,	3½		3½ p.c. max. .	89—91	−1	3 16 11
3,799,735	,,	,,	4		4 p.c. Con. Pref.	111—113	..	3 10 10
4,193,975	,,	June 12	3		3 p.c. Con. Deb.	93—95	+1	3 3 2
70,000	10	Nov. 13	8	Hongkong & China, Ltd.	13—14	..	5 14 4
3,800,000	Stk.	May 14	10	Imperial Continental .	203—206	..	4 17 1
473,600	Stk.	Feb. 13	3½	Do. 3½ p.c. Deb. Red.	100—102	..	3 8 8
561,000	Stk.	Feb. 27	10	Liverpool United A .	220—222	..	4 10 1
718,100	,,	,,	7	Do. do. B .	165—167	..	4 3 10
306,083	,,	June 24	4	Do. do. Deb. Stk.	116—118	..	3 7 10
75,000	5	June 12	5	Malta & Medn., Ltd. .	4¼—4⅝	..	5 5 3
560,000	100	Apl. 1	5	Met. of Melbourne	5 p.c. Deb.	106—110	..	4 10 11
250,000	100	,,	4½		4½ p.c. Deb.	103—105	..	4 5 9
541,920	20	June 12	5½	Monte Video, Ltd. . .	9—10	..	7 0 0
1,515,892	Stk.	Feb. 21	4⅝	Newc'tle & G'tesh'd Con.	103—106	..	4 2 7
346,855	Stk.	July 4	3½	Do. 3½ p.c. Deb.	98—100	..	3 10 0
150,000	5	May 28	8	Oriental, Ltd. . . .	7—7½	..	5 6 8
135,000	4½	,,	8	Do.	6—6½	..	5 10 9
15,000	1	,,	8	Do.	1¼—1⅝	..	4 11 5
					* Ex div.		

Issue.	Share.	When ex-Dividend.	Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.	GAS COMPANIES.			£ s. d.
60,000	5	Mar. 13	7	Ottoman, Ltd. . . .	6½—6¾	..	5 3 8
851,070	10	Apl. 25	7	River Plate Ord. . .	10—10½	..	6 13 4
300,000	Stk.	June 24	4	Do. 4 p.c. Deb. .	93—96	..	4 3 4
250,000	10	Mar. 26	8	San Paulo, Ltd. . . .	12—13	..	6 3 1
135,000	Stk.	Mar. 13	10	Sheffield A	239—241	..	4 3 0
209,984	,,	,,	10	Do. B	238—240	..	4 3 4
523,498	,,	,,	10	Do. C	237—239	..	4 3 8
5,850,000	Stk.	Feb. 13	5	South Met., 4 p.c. Ord.	124—128	+3½	3 18 2
1,627,965	,,	July 11	3	Do. 3 p.c. Deb. . .	92—94*	..	3 3 10
380,940	Stk.	May 14	5	Southampton Ord. . .	102—106	..	4 14 4
87,930	,,	July 11	4	Do. 4 p.c. Deb.	100—103*	..	3 17 8
120,000	Stk.	Feb. 27	5½	Tottenham and Edmonton	A. 5 p.c.	120—125	..	4 8 0
260,520	,,	,,	4		B. 3½ p.c.	95—100	..	4 0 0
182,380	10	Jan. 16	5	Tuscan, Ltd. . . .	7—8	..	6 5 0
149,900	10	July 1	5	Do. 5 p.c. Deb. Red.	95—98	..	5 2 0
230,000	5	Mar. 13	5½	West Ham, 10 p.c. . .	10—11	..	4 6 4
172,000	10	,,	6½	Do. 7 p.c. . .	13—14	..	4 12 10
				WATER COMPANIES.			
780,599	Stk.	June 24	11½	Chelsea, Ord. . .	300—310	..	3 14 2
150,000	,,	,,	5	Do. 5 p.c. Pref. .	152—157	..	3 3 8
160,000	,,	,,	4½	Do. 4½ p.c. Pref. '75	140—143	..	3 2 11
175,785	,,	Mar. 26	4½	Do. 4½ p.c. Deb. .	140—145	..	3 2 1
1,720,560	Stk.	Mar. 26	8	East London, Ord. . .	217—222	+2	3 12 1
654,740	,,	June 12	4½	Do. 4½ p.c. Deb. .	142—147	..	3 1 3
1,018,046	,,	,,	3	Do. 3 p.c. Deb. .	96—98	..	3 1 3
700,000	50		8	Grand Junction	10 p.c. max..	112—117	..	3 8 5
310,000	Stk.	Mar. 26	4		4 p.c. Deb..	127—130	..	3 1 7
708,000	Stk.	Feb. 13	16	Kent	290—300	..	5 6 8
160,000	,,	,,	7	Do. New, 7 p.c. max..	200—210	..	3 6 8
1,043,800	100	June 24	11	Lambeth, 10 p.c. max..	295—305	..	3 12 2
406,200	100	,,	8½	Do. 7½ p.c. max..	210—220	..	3 17 3
350,000	Stk.	Mar. 26	4	Do. 4 p.c. Deb..	125—130	..	3 1 7
500,000	100	Feb. 13	12⅛	New River, New Shares	400—410	..	3 2 5
1,000,000	Stk.	Jan. 30	4	Do. 4 p.c. Deb..	127—132	..	3 0 7
902,300	Stk.	June 12	7	South-wark and	Ord. . . .	190—195	..	3 11 10
126,500	100	,,	7		7½ p.c. max.	180—185	..	3 15 8
489,200	Stk.	,,	5		5 p.c. Pref. .	152—157	..	3 3 8
1,019,585	,,	Apl. 11	4	Vauxhall	4 p.c. A Deb.	125—130	..	3 1 7
1,155,066	Stk.	June 12	10	West Middlesex. . .	275—285	..	3 10 2
200,000	,,	,,	4½	Do. 4½ p.c. Deb. .	139—144	..	3 2 6
200,000	,,	Mar. 13	3	Do. 3 p.c. Deb. .	95—97	..	3 1 10
					* Ex div.		

† Next dividend will be at this rate.

Whether or not the department is entitled to reckon the land, buildings, chimney-shafts, furniture, machinery, accumulators, mains, meters, electrical instruments, tools, &c., at the sum which they cost to purchase, is a matter of question. Accountants might reasonably argue not, as practically nothing has been allowed for repairs or depreciation. Certainly, the undertaking at the moment this account was made up was in the first year of its existence. The land might be taken at its full face value; but that office fittings, fixtures, and furniture, which cost £1636, should not be reckoned in at that amount, or that the machinery, mains, and so forth, should be liberally discounted, is a course that most private business men would take in order to be on the safe side. Therefore this net loss of £2574, if the accounts were made out on the ordinary business lines, and not on Electricity Department lines, would be shown to be much larger than it really is.

Coming to the accounts for the year ending the 31st of March last, the capital powers at that time were raised to £135,653, of which £26,653 has not yet been borrowed. The capital expended amounts to £114,890; and, of course, there has been a considerable amount of building done and additional machinery provided. Among other items in the capital account, one entry stands out again prominently—"Consulting Engineer's fees, £2194 1s. 3d." On what system are these paid? As it is a matter of common knowledge that Mr. Wright is actively associated with the management, surely a proportion should have been debited to the revenue account. Turning to this, the position is much better. The expenditure went up to £6102; but, to the credit of the department, it should be said that the increase is not due to increases in salaries, which apparently are kept remarkably low. The receipts show that the undertaking is of a progressive nature; the amount received from the public supply having risen to £8230. Public lighting is credited with £1908; and the total revenue is £11,222—leaving a balance available to meet capital charges and depreciation of £5120. Turning to the net revenue account, £2956 was paid for interest, and £117 for instalments of principal, leaving a balance of £2034 available for extinguishing the deficit on March 31, 1901, for future capital charges, and depreciation. A memorandum sets out the position. Deducting the £2034 surplus from the £2743 deficit in 1901, leaves a balance of £709, which, giving credit for the two amounts paid in reduction of debt, leaves a deficiency of £422, which corresponds with the recorded deficiency of assets—the liabilities being returned at £122,730, and the assets at £122,308. As far as can be seen from the accounts, the various things, including professional services and labour, on which money has been spent are still taken at their purchase price of £114,890, which is the exact amount of capital expenditure.

The public lighting account calls for notice. Referring to the old reports of the Whitechapel Board, the total annual gas bills averaged £4200 in round figures. The Whitechapel gas bill is now about £3000; and the cost of electric lighting, with renewals and repairs of arc lamps, was £2762 in the year 1901·2. So that to save £1200 in gas the Local Authority have spent £2762. The increased cost of public lighting is therefore some £1500 per annum. Is this rate of increase to go on all over the borough? The ratepayers' prospects are therefore somewhat indifferent. The Borough Council must attend to this, or the street lighting cost will go up some thousands of pounds. Then there is another item which explains a great deal. The Electricity Department get their fuel practically from the dust destructor; and hitherto the cost has been 0·3d. per unit generated. At a recent meeting of the Borough Council, the Works Committee reported that this was too low, and recommended that the charge in future should be 0·8d., or treble the charge for steam. Last year this item cost £1085. If the alteration is carried out, the charge for steam to the Electricity Department will be about £3000, and this will swallow the whole of the profit. What has been done is very simple. The electricity installation has obtained its power cheap, and through the dust destructor the ratepayers may possibly have paid the balance. An average price for destructor steam, which is of indifferent quality, is 0·4d. Up to now, it has been charged at 0·3d.; but at 0·4d. the destructor finances would have about balanced. The Electricity Department, of course, object to an increase in the charge. They say the loss to the destructor has only been £148 last year, and that their department has only benefited by this amount. This is a nice problem which the writer of the article does not pretend to be able to solve. But there is no wonder, after all, that, under these circumstances, the department shows a profit on the second year. It is as well that these points should be emphasized. Then, the apportionment of wages in the various departments might be revised—£6 14s. 4d. representing the allotted wages for the distribution of electricity for a year. It would not pay the wages of a mechanic for a month.

The writer considers that if the position of the department is not satisfactory, it is not alarming. As a matter of fact, it is what might be expected. An installation of this character cannot be made to pay for itself in the first two or three years. At the same time, however, he considers that fault is to be found at there being no statement of the large excess of liabilities over assets, though the liabilities are not grave at the moment—that is to say, the capital expenditure is a liability spread over many years. It is obviously misleading to take machinery two or three years old, especially electric lighting machinery, furniture, and buildings, at the price which they originally cost. The small deficiency of assets is a paper one only; the correct deficiency being very large. Capital has been spent, and it will take years of small profit to overtake it.

Sales of Shares and Stock.—At Wigton, last Tuesday, Mr. W. Hope sold by auction five £10 shares in the Wigton Gas Company at £14 17s. 6d. each. On the same day, Messrs. Sedgwick, Son, and Weall offered for sale £1500 of "C" stock (7 per cent.) of the Watford Gas Company, on which the Company are paying 9 per cent. dividend. It was put up in lots of £25, each of which fetched £45, The Company have now raised £63,000 out of the £90,000 for which they have powers.

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CARDIFF CORPORATION WATER SUPPLY.

Annual Inspection of the Works.

The members of the Cardiff Corporation last Wednesday made their annual inspection of the Taff Fawr Water-Works; the party being accompanied by the Water Engineer (Mr. C. H. Priestley, Assoc.M. Inst.C.E.). On reaching Merthyr, the company were driven up the Taff Fawr Valley; the site of the intended reservoir No. 3 abreast of Llwynon being especially noted. This reservoir is one of the series for which parliamentary powers have been obtained; but Mr. J. B. Williams and Mr. Priestley, in a joint report presented by them on the subject, recommend a larger reservoir than was originally shown. The capacity under the old scheme was about 640 million gallons; but under the new one it will be 906 millions. This will provide for the whole of the compensation water due to the full area from which the Corporation can withdraw water. The top water-level will be 846 feet above Ordnance datum, the top area will be 118 acres, and the height of the embankment about 65feet. The joint report of the Engineers was presented to the Water Committee a few months ago; but no decision has yet been arrived at as to when the work will be commenced, or as to what steps will be taken to increase the supply to the town and district generally. Some further provision will be absolutely necessary in a few years. The party afterwards made an inspection of the Cantreff reservoir and works. The capacity of this reservoir is 322 million gallons; and from it the compensation water for the 4000 acres at present utilized – viz., 3 million gallons per day—is delivered to the Taff Fawr River for the benefit of the millowners and others. After an inspection of the works at this place, the party drove to the Beacons reservoir, which has a capacity of 345 million gallons.

WATER SUPPLY TROUBLES IN SPAIN.

The meeting of the Seville Water-Works Company, which was held last Friday, at the Cannon Street Hotel, was of more than ordinary interest—not because there was a flourishing statement to lay before the shareholders, but, on the contrary, because the net profit has dropped by nearly three-quarters in comparison with the preceding year, and there was no dividend for the shareholders. This state of things imposed on the Chairman (Mr. Cowley Lambert) the duty, and he did it well, of explaining how it arose; and in doing this, he threw a considerable amount of light upon the natural difficulties which water undertakings encounter in Spain, and upon the little sympathy which foreign enterprise receives at the hands of the local authorities. Before giving an abbreviated account of his statement, it may be mentioned that during the year ending March 31 last, the income of the Company amounted to £28,544; and, after deducting working expenses, the cost of laying on services, and debenture interest, the net profit was £1412, as against £5299 in the preceding twelvemonth. Adding to the net profit the unappropriated sum on March 31, 1901—viz., £8320—made the amount at the credit of profit and loss account £9732. This the Directors recommended should be carried forward.

Having expressed his sorrow that the accounts were not more satisfactory, the Chairman stated that the loss of profit was due to two or three causes. First, notwithstanding various economies, the expenditure had been greatly increased, chiefly by the purchase of water from the Municipality for a longer period than in the preceding year; secondly, by new Imperial taxation; and, thirdly, by a further fall in the rate of exchange. On the other hand, there was a decrease in the amount paid to the Company by the town and by the shipping; and a further decrease owing to a discount of 10 per cent. to the customers, which the Directors felt bound to allow in view of the fact that they were unable to afford them a constant supply. But apart from this, the water-rentals had increased by about 15,000 pesetas, which showed a steady progress in the business; and the Directors were hopeful, when they had their new water supply in working order, the business would be more successful than it had been during the past year. The great trouble with them was the want of water; and he could not help recognizing the fact that of all commercial undertakings, a water-works was the only one that was dependent for its success upon the weather. Nature had been particularly unkind to them during the past few years. If there was no rainfall in the autumn to fill the springs, they could not be expected to find sufficient water to supply their customers. The three months in the year when they had the greatest rainfall were October, November, and December; and they looked to these months for sufficient rain to fill up the springs for the following summer. Taking the last eight years, he found that, in the three months named, of the four years 1894-7, there was a rainfall of 1242 mm.; but during the four months of the second period—1898-1901—there was a rainfall of only 598 mm., which showed a falling off of more than 50 per cent. This was a very serious difficulty for the Company; and he was sorry to say that it had been made a great deal worse by the spirit of hostility with which they were met by the Municipality. Only two months ago, he and Mr. T. P. Wilson (one of the Directors) visited Seville for the purpose of meeting the authorities, and to try to arrange some means of increasing the supply of water during the hot months of the year. They were received with courtesy, and were asked to put their views before the Municipality in writing. This they did; but, as soon as their backs were turned, the hostile spirit of a part of the Municipality showed itself again. The letter was actually not discussed by the Authority; and they declined to help the Company, or to do anything in the matter upon which he and Mr. Wilson went out. This was not peculiar to Seville; it was simply the spirit of hostility that was shown against all foreign enterprises throughout the whole of the South of Spain. The Directors were

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doing, and had done, their best to provide a proper water supply; and, he was sorry to say, at the cost of the shareholders. They had a new reservoir which would be completed by August; but the works for bringing the water from the Cañada de Otivar would not be finished by the same time, owing to the obstacles put in their way by the owners of land and others. If they had been able to get hold of the land at an earlier date, they would have been in a position to obtain the benefit of the water as the works proceeded. However, although the work was not far advanced, they heard that morning that they were already in possession of a supply approaching 180,000 gallons a day. He hoped—in fact, he had little doubt—that when the works were completed, they would have such a supply that they would not have to buy any water from other quarters.

The shareholders showed their sympathy with the Board by not discussing the report and accounts, and by adopting them unanimously. The re-election of the retiring Directors and the Auditors was the only other business to engage attention.

NOTES FROM SCOTLAND.

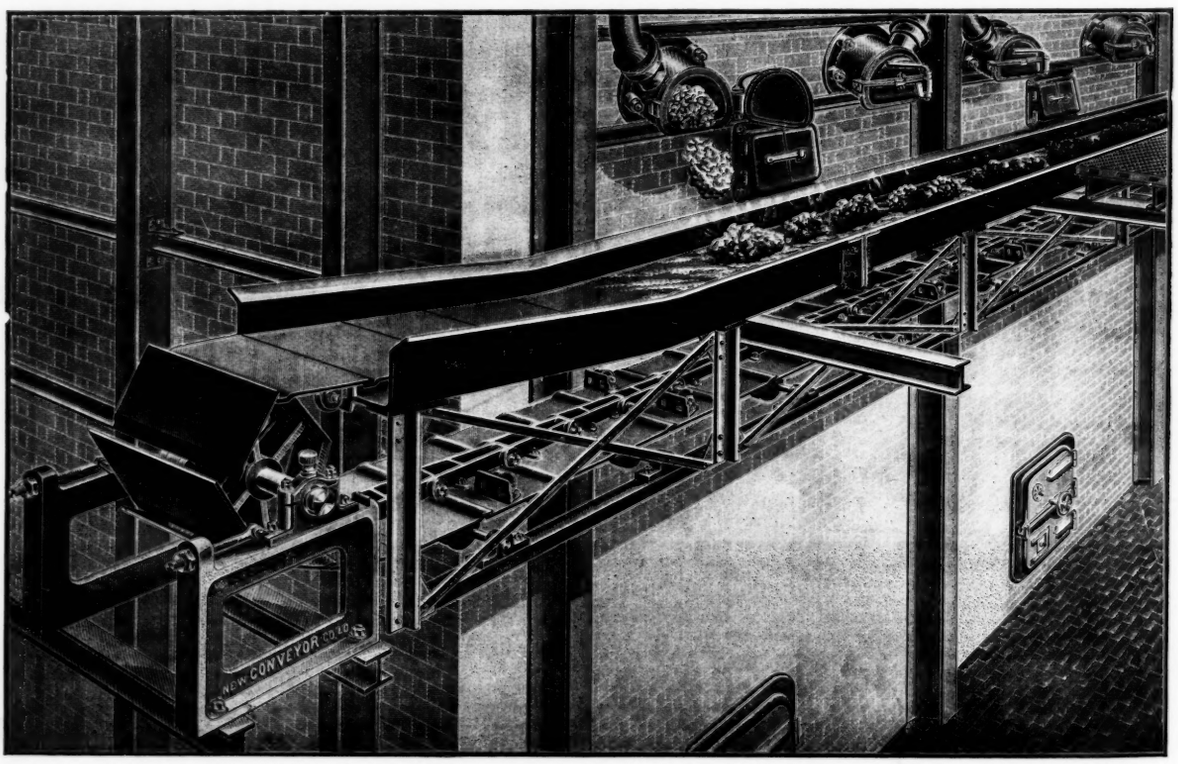
From Our Own Correspondent.

Saturday.

In the matter of gas supply, what the public like is a high illuminating power and a low price. In both of these respects Alloa stands first; the price of gas of 24-candle power being only 2s. 4d. per 1000 cubic feet. The nearest to the charge in Alloa is 2s. 6d., which is the rate in Glasgow, Hamilton, and Broughty Ferry; but in the two former only 21-candle power gas is supplied. In Broughty Ferry, the candle power is 24; but, as is stated farther on, the price of gas there is about to be raised. Dumbarton, for its 25-candle gas, charges 2s. 9d; and, in Greenock, for 24-candle gas the price is 2s. 11d. There are no other places in the comparison. There is no gainsaying the fact that it is to the careful management of Mr. A. Yuill that the position at Alloa is due. Observation brings this home to everyone, even to the editors of the local Press, who, most remarkably, speak of Mr. Yuill as an "enlightened and progressive Manager." This is written in an editorial article in which the inhabitants are congratulated upon living "in a town where the production of the domestic illuminant is so eminently successful, alike practically and financially." The text of the article is the balance-sheet of the gas undertaking, which was submitted this week at a meeting of the Gas Committee of the Town Council. There is a profit of £328 upon the working for the year. This, it is stated, would have sufficed for a further reduction of, probably, 2d. per 1000 cubic feet; but the Corporation, having to meet a deficit in this, the first year of their electric lighting adventure, have appropriated £152 of the gas surplus to meet it. The balance has been applied in writing down capital in several accounts. The total income was £11,977, of which £9705 was derived from the sale of gas, £875 from coke, and £1314 from tar, &c. The expenditure amounted to £11,649. Of this, £4456 was paid for coal, as compared with £5904 in the preceding year, and £501 for benzol. The total cost of gas, exclusive of interest on loan and sinking fund, was 2s. 1·94d., as compared with 2s. 7·77d. Inclusive of these funds, the total cost was 2s. 7·55d., as compared with 3s. 1·65d. The net cost is given at 1s. 8·01d., as compared with 1s. 9·54d. The quantity of gas manufactured was 88,602,200 cubic feet, as compared with 79,170,700 feet. It is a notable fact connected with gas supply in Alloa that there has been no raising of the price during the past fifteen years. In 1888 it was 3s. 9d., next year 3s. 6d., the following five years 3s. 4d., then 3s. for one year, 2s. 10d. the next, 2s. 6d. for five years, and last year 2s. 4d. In the same time the manufacture has risen from 28 to 88 million cubic feet a year. Progress has thus been constantly upwards in the matter of output, and as constantly downwards in the matter of price.

Another place which is in the leading line in the matter of gas supply is Peebles. There the total quantity sold during the past year was 22,401,900 cubic feet. Last year there was an increase at the rate of 10 per cent. in the output, and in the previous year one of 16⅔ per cent. For the current year, the estimate is for 24,082,000 cubic feet, an increase of 7½ per cent. The estimated income is £4746, and the estimated expenditure £3596; leaving an anticipated surplus of £1150 The accounts were considered at a meeting of the Town Council on Monday. Provost Ballantyne said that they appreciated very highly the way in which Mr. Bell, the Engineer, had managed the works, and they had voted him a bonus of £50, and increased his salary. They knew, too, that along with Mr. Bell, the success of the undertaking was very largely due to the Treasurer (Mr. Williamson). He thought they might congratulate the public of Peebles on the great success of the gas undertaking. It must be a very pleasant thing for people to know that the price of gas had been reduced in three years from 4s. 2d. to 3s. 4d. per 1000 cubic feet; and to those who had prepayment meters, it must be a very satisfactory thing to get 4s. per pound discount, which, as had been said, was a very good dividend. He had no doubt that the discount would encourage people to use gas, and would thereby help to make the undertaking a still greater success. The accounts and estimates were adopted.

The Corporation gas-works at Dunfermline are among the best managed in the country. It is true that the price of gas is not lower than 3s. per 1000 cubic feet to ordinary consumers; but the high charge is doubtless due to the size of the capital account, which was greatly swelled some ten years or so ago, by the cost of the erection of gas-works upon a new site. This is the only drawback to the undertaking. Everything else is on the appreciative. The accounts for the year were before the Town Council on Monday. Bailie Harley said that they estimated a revenue from gas of £14,024 for the year; and they had actually received £15,355, or £1331 more than they expected. They estimated £260 from meters, stoves, &c., and they had received £286. There had a been a considerable slump in the receipts for coke,



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tar, and sulphate. The net increase of revenue for the year was £273. They estimated an expenditure of £15,437; and their actual expenditure had been £15,178, or £259 less. This made a total gain of £533. The Committee had had the subject of the disposal of the profits before them; and in view of the satisfactory results, and the fact that coal had fallen in price, they recommended a reduction in the charge for gas to the extent of 5d. per 1000 cubic feet to ordinary consumers and for public lighting, making it 3s.; to prepayment consumers, 3s. 6d.; and for gas-engines, 2s. 6d. The Manager (Mr. A. Waddell) had done patient and good work during the year, and deserved special recognition. He had designed plant for the handling of coal and coke, which, when completed, would put them in the position of being the most efficient and economically operated gas works for their size in Scotland. He moved the adoption of the recommendations of the Committee, and that Mr. Waddell receive an honorarium in recognition of his services. This was agreed to.

A special meeting of the Perth Town Council was held on Monday, to consider the report by Mr. Thomas Newbigging upon the alleged increases in the charges for gas. There was a very small attendance. Lord Provost Macgregor said the report extended to seventeen pages of prettily executed literature. It might be received with mixed feelings by the Council and by the community of Perth; but Mr. Newbigging had expressed a great deal of thought in the report. The Town Clerk read Mr. Newbigging's charges, which amounted to £157 10s. for fee, and £20 3s. for railway and hotel expenses—a total of £177 13s. Mr. Macpherson moved that they deal with the report in private. There were, he said, nine members of the Council absent; and they had also to consider the astounding cost. The Council resolved, by ten votes to eight, to discuss the subject in private, which they then proceeded to do. Now that the day of reckoning has come to the Council, is there any element of shame in the breasts of those who encouraged the agitation about the gas charges? It would almost seem to me as if there really were.

Another instance of overbearing action on the part of public auditors is reported from Dumfries. The Auditor of the burgh accounts took exception to the allowance of discount to large consumers of gas. Thereupon the Council took what was the best course for them in the circumstances—they consulted Counsel (Mr. Guthrie, K.C.), who has advised them that the practice they have been following is quite legal. This opinion has been transmitted to the Auditor. This may not be the last of the incident, as the opinion is not authoritative.

The Broughty Ferry Town Council had the accounts of the Gas Department for the past year before them on Monday. Mr. G. Watt, the Convener of the Finance Committee, said they began the year with a deficit of £996, and they had ended it with a deficit of £1025. The revenue from the sale of gas was less than was estimated by £368. The explanation of this was that there had been a falling off in the demand for stoves. In consequence, however, of the resolution the Commissioners recently passed—as to charging for fixing cookers—the demand was again better. Coke, which was estimated to bring in 8s. per ton, had only realized 7s.; and there had also been a deficiency as regarded sulphate of ammonia. The receipts were £675 less than the estimate, and the expenditure £415 more. Bailie Kidd said there were two main factors which had prevented them from clearing off the debit. One was that when they were prospering in the matter of supplying cookers—thereby increasing the consumption and getting a good return for the hire—a small majority of the Council doubled the charge for hire, and decided that connections, instead of being made free, should be charged for. Another important matter was that the Dundee Corporation sent a very large quantity of coke into the market, which had the effect of reducing the income in Broughty Ferry very considerably. Provost Gray pointed out that the doubled hire for cookers was only in force for three months. The accounts were adopted; and the Council delayed the fixing of the price of gas. It is expected that it will be raised from 2s. 6d. to 3s. 1d. per 1000 feet.

The Arbroath Gas Corporation had before them on Monday a statement of the gas made and sold during the past year. This showed that the quantity of gas made was 67,971,800 cubic feet; gas sold, 60,437,494 cubic feet; to be accounted for, 7,534,306 cubic feet; used in works, &c., 731,376 cubic feet; unaccounted for, 6,802,930 cubic feet. The unaccounted-for gas is thus 9·8 per cent. The gas sold shows an increase over the previous year of 1,167,594 cubic feet. Mr. Thomson asked if 9·8 per cent. was not too much for unaccounted-for gas. The Manager (Mr. A. B. Young) said that 10 per cent. was not uncommon, and that for a number of years past the leakage in Arbroath had been from 8 to 10 per cent.

The annual meeting of the partners of the Montrose Gas Company was held on Wednesday. The balance-sheet showed a credit of £785, which allowed for a dividend at the rate of 30s. per share, as against 50s. per share during the past few years. The Chairman explained that the Company had lost nearly all the public lighting, which, of course, materially reduced their income. A number of large consumers also had introduced electric lighting into their works and shops. Last year they had a credit balance of about £1300. The Directors had considered the subject of the reduction in the price of gas; but they preferred to give discount on prompt payment of accounts, and did not feel warranted in reducing the price all over. The report was adopted. The Kilsyth Town Council have resolved to reduce the price of gas by 5d. per 1000 cubic feet, and have expressed the hope that in the course of the winter it might be possible to make another reduction of 5d. The annual meeting of the Kirkcaldy Gas Company was held on Monday. During the year there was a capital expenditure of £3235, chiefly for the new condensers, scrubbers, and extension and enlargement of mains and service-pipes. The quantity of gas manufactured was 131,649,500 cubic feet—a slight decrease on the previous year; but the Directors considered it very satisfactory, in view of the general dulness of trade during the winter. The price had been reduced to 3s. 4d. per 1000 cubic feet—a total reduction of 3½d. during the past

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SALTLEY WORKS, BIRMINGHAM	2,000,000
COLCHESTER	300,000
BIRKENHEAD	2,250,000
SWINDON (New Swindon Gas Co.)	120,000
SALTLEY, BIRMINGHAM (Second Contract)	2,000,000
WINDSOR ST., BIRMINGHAM (Second Contract)	2,000,000
HALIFAX	1,000,000
TORONTO	250,000
OTTAWA	250,000
LINDSAY (Remodelled)	125,000
MONTREAL	500,000
TORONTO (Second Contract; Remodelled)	2,000,000
BELLEVILLE	250,000
OTTAWA (Second Contract)	250,000
BRANTFORD (Remodelled)	200,000
ST. CATHERINES (Remodelled)	250,000
KINGSTON, PA.	125,000
PETERBOROUGH, ONT.	250,000
WILKESBARRE, PA.	750,000
ST. CATHERINES (Second Contract)	250,000
BUFFALO, N.Y.	2,000,000
WINNIPEG, MAN.	500,000
COLCHESTER (Second Contract)	300,000
YORK	750,000
ROCHESTER	500,000
KINGSTON, ONT.	300,000
CRYSTAL PALACE DISTRICT	2,000,000
DULUTH, MINN.	300,000
CATERHAM	150,000
LEICESTER	2,000,000
ENSCHEDE (HOLLAND)	150,000
BUENOS AYRES (RIVER PLATE CO.)	700,000
BURNLEY	1,500,000
KINGSTON-ON-THAMES	1,750,000
ACCRINGTON	500,000
TONBRIDGE	300,000
STRETFORD	500,000
OLDBURY	300,000
TODMORDEN	500,000
SALTLEY, BIRMINGHAM (Third Contract)	2,000,000
YORK (Second Contract)	750,000
ROCHESTER (Second Contract)	500,000
NEWPORT (MON.)	250,000
TOKIO, JAPAN	1,000,000
PERNAMBUCO (Brazil)	125,000
MALTON	150,000
DULUTH, MINN. (Second Contract)	300,000

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GRAVESEND, 300,000 C. Ft. BROCKVILLE (ONT.), 250,000 C. Ft. NEWPORT, MON. (2nd Cont.), 250,000 C. Ft.

two years. The report was adopted. The Berwick and Tweedmouth Gas Company held their annual meeting last Wednesday. It was reported that the profit for the year amounted to £1257. The income was £7037, and the expenditure £5780. A dividend of 10 per cent. was paid, and the price of gas was reduced from 3s. 10d. to 3s. 9d. per 1000 cubic feet. The Ferry-Port-on-Craig Gas Company have paid a dividend at the rate of 5 per cent., and have reduced the price of gas from 5s. 5d. to 5s. per 1000 cubic feet. The Laurencekirk Gas Company have resolved to reduce the price of gas after November to 6s. 8d. for lighting, and to 5s. per 1000 cubic feet for other purposes.

CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *July* 19.

Sulphate of Ammonia.

The market has been very quiet at all points, and a further decline in prices has to be recorded. There is no large supply to depress values; but, on the other hand, buyers are indifferent about prompt, while near delivery can be had at a discount on prompt prices. The closing quotations are £12 per ton f.o.b. Hull, and £12 to £12 2s. 6d. per ton f.o.b. Liverpool and Leith. In the forward position, no first-hand business is reported, makers not having so far met buyers' ideas as to values; and although speculators have been offering freely abroad at a discount of 5s. to 10s. per ton, according to position, they have not met with much success.

Nitrate of Soda.

This is weak in all positions, and spot prices are 8s. 6d. to 8s. 9d. per cwt., according to quality.

LONDON, *July* 19.

Tar Products.

There is very little business doing in tar products—in fact, with the exception of pitch, there is no demand for same. Carbolic is very dull; consumers will only purchase for early delivery, and will not exceed 1s. 9d. for 60 per cent. crude. In crystals, business is reported at 5½d., but only for limited quantities and for prompt delivery. In creosote, the position remains unchanged as regards the midland and northern districts; but the London market is certainly easier. There appears to be rather more offering for early delivery. The demand for pitch continues very good indeed for home consumption; but as regards shipment, there is nothing doing for early delivery. So that prices paid in London can hardly be taken as a guide to values ruling on the Continent. The demand from South Wales, however, is still very good, both for prompt and forward delivery. Solvent is quiet. There is a little business doing for home consumption in special qualities; but no inquiry for export. For toluol and anthracene, there is no demand, and prices quoted are purely nominal.

The average values during the week were: Tar, 17s. 6d. to 22s. 6d. Pitch, London, 50s. to 53s.; east coast, 47s. 6d. to 48s. 6d.; west coast, 42s. to 42s. 6d. Benzol, 90 per cent., 8d.; 50-90 per cent., 7d. Toluol, 8d. Crude naphtha, 2½d.; solvent naphtha, 9d. to 9½d.; heavy naphtha, 9d. to 10d. Creosote, London, 1⅛d. to 1¼d.; North, 1d. Heavy oils, 1⅛d. Carbolic acid, 60 per cent., 1s. 9d. Naphthalene, 35s. to 50s.; salts, 21s. to 22s. 6d. Anthracene, "A," 1½d. to 1⅝d.; "B," 1d. nominal.

Sulphate of Ammonia.

The market remains quiet, and there is really an absence of business just at present, both for prompt and forward delivery. As regards Beckton, the position is unchanged—no transactions having taken place in actual Beckton, although business is reported at £11 17s. 6d., Beckton terms, for early shipment. In Liverpool, the market continues dull; small quantities have been sold for prompt at £12. In Hull, there is no business; but the value may be taken as nominally about £12 for early shipment. Business in Leith appears to be at a standstill; at the same time sellers are not pressing anything on the market for early delivery. Prices are practically nominal; £12 2s. 6d. to £12 3s. 9d. may be taken as the closing values.

COAL TRADE REPORTS.

Lancashire Coal Trade.

On clearance sales and for short contracts there are low quotations here and there, but generally prices are being very steadily maintained. Where the output is in excess of what is required to lay down into stock, coalowners in most cases are putting pits on lessened time rather than force sales in the open market, and it is exceptional where collieries are now running more than about four days per week. House-fire qualities of round coal are meeting with only the most restricted inquiry, which, of course, is simply the natural result of the season of the year; and Lancashire coalowners, recognizing the fact that lower prices would scarcely bring forward any appreciable additional buying, are holding generally to their quoted rates, except where some special competition from outside districts has to be met which threatens their regular trade. Best Wigan Arley averages 13s. to 14s. per ton at the pit, Pemberton four-feet and seconds Arley 11s. 6d. to 12s., and common house coal 9s. 6d. to 10s. The lower qualities of round coal seem to be the most difficult to deal with just now; and it is mostly in these where prices are being cut much under current rates. For special clearance sales—chiefly, however, for shipment—as low as 7s. 6d. to 7s. 9d. is, in isolated instances, being accepted, with 8s. to 8s. 6d. taken for short deliveries; but forward contracts would scarcely be accepted much under 8s. 6d., with some of the better qualities of steam and forge coal quoted from 9s. to 9s. 3d. per ton at the pit. Gas coal contracts are now being got through in a fairly

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satisfactory manner to coalowners, with prices generally about on the basis that has been previously quoted ; Arley slack, suitable for gas making, ranging from 7s. 6d. upwards, gas nuts from 8s. 3d. upwards, according to quality, Wigan four-feet gas coal 9s. to 9s. 6d., and best screened Wigan Arley gas coal 10s. to 10s. 3d. at the pit. Slack has not been quite so plentiful on the market, owing, however, mainly to the check given to surplus supplies coming in from outside districts in consequence of numerous serious disputes on the wages reduction at collieries in Yorkshire and Staffordshire. This has tended to give rather more steadiness to prices here, and common Lancashire slack could scarcely be bought under 4s. 9d. to 5s. per ton at the pit, with best descriptions firm at 6s. 6d. to 7s. For shipment, which is only indifferent, prices range from 9s. 6d. to 9s. 9d. on special sales, up to 10s. and 10s. 3d. as ordinary quotations for good qualities of steam coal, delivered at the ports on the Mersey. Coke manufacturers report an active inquiry—in some instances more than sufficient to take away all they are making—and prices are strong, with a slight hardening here and there on forward contracts. At the ovens, quotations may be given as firm at 22s. to 24s. per ton for best Lancashire foundry, 13s. 6d. to 14s. 6d. for furnace cokes, and 13s. 6d. to 14s. for good washed Yorkshire furnace coke, to 14s. 6d. for some special sorts. For gas cokes, prices are also tending upwards ; but these vary considerably, according to situation of works and delivery.

Northern Coal Trade.

There is a stronger demand for coals, both for export and for home use ; but the output is fully up to the average, and meets all requirements without any pressure. Best Northumbrian steam coals are active ; and the price is maintained at from 11s. 3d. to 11s. 6d. per ton f.o.b. Second-class coals are only in moderate demand, and are dull at from 9s. 6d. to 10s. ; while steam smalls are fairly plentiful at from 5s. per ton. In the gas coal trade, the consumption begins to show a slight increase ; but it is still only very small to what is usual. A month or so will enlarge it, and meantime users will increase their stocks. Prices of gas coals, for occasional cargoes, vary from 8s. 6d. to about 9s. 3d. per ton f.o.b. ; while a few contracts may be said to be at about 8s. 9d. to 9s. per ton, according to the quality of the coal. Gas coke is rather irregular, with quotations that may average from 10s. to 10s. 6d. per ton f.o.b.

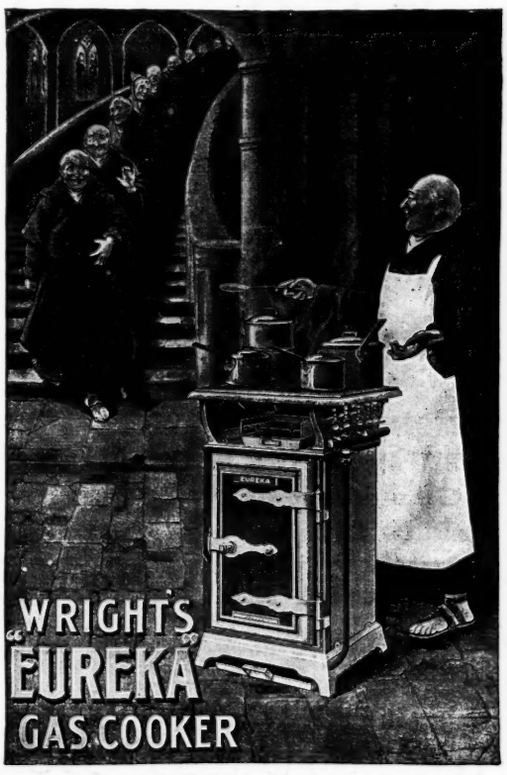
Scotch Coal Trade.

This is now the holiday season, and trade is somewhat disturbed. One effect has been the creation of a demand for supplies to tide over the time when work will be slack in the mines. Stocks have thus to some extent been drawn upon. The prices quoted are: Main 8s. 6d. to 8s. 9d. per ton f.o b. Glasgow, ell 9s. 6d. to 10s. 6d., and splint 9s. 3d. to 9s. 6d. The shipments for the week amounted to 239,121 tons – an increase of 20,690 tons upon the previous week, and of 19,782 tons upon the corresponding week of last year. For the year to date, the total shipments have been 5,407,060 tons—an increase of 359,943 tons upon the same period of last year.

The Beverley Gas Committee and the Sale of Coke.—At the last monthly meeting of the Beverley Town Council, a long discussion took place on a motion that a previous resolution "empowering the Gas Committee to fix the price of coke for a period of six months" should be rescinded. The motion was supported by nearly every councillor present. The discussion turned mainly on the charges made to Beverley consumers of coke, and the prices to outsiders ; the objection being that the latter bought at a cheaper rate. After a reply from Alderman Green, the Chairman of the Gas Committee, who took the motion as one of censure on the Committee, and a want of confidence in himself, the resolution was carried. He thereupon resigned the chairmanship.

The Rickmansworth District Council and the Gas-Works.—At a recent meeting of the Rickmansworth Urban District Council, the Chairman (Mr. C. F. Yorke) moved a resolution empowering the Council to promote legislation for the purchase of the Rickmansworth Gas Company. He contended that all gas and water undertakings should be in the hands of the people who provided the revenue, and pointed to the necessity for prompt action. Under the Act recently obtained, the Company could not oppose the Council's Bill. The latter were empowered to buy at a valuation, *plus* 10 per cent. for compulsory purchase ; but the transaction must be carried out within twelve months. It was a unique opportunity for the Council, of which he hoped they would have the foresight and enterprise to avail themselves. Mr. Colin Taylor, in seconding the motion, said it would be nothing short of a calamity if the opportunity were allowed to slip. The only opposition came from members who thought that all the facts and figures should be divulged before a decisive step was taken ; and the question was therefore referred to a Committee consisting of the entire Council.

A Successful American Municipal Gas Undertaking.—The Superintendent of the City Light Department of Richmond, Va. (Mr. Knowles), in the course of his report on the operations of the municipal gas undertaking for the past financial year, made the following remarks : "During the period of thirty years from 1867 to 1896, the gas-works of the city paid to the City Treasurer the sum of $1,174,855 over and above the sum drawn out for the cost of running the works and producing the gas. This amount exceeds the total of the construction and extension accounts for thirty years by $527,283 ; and, deducting the cost of the plant previous to 1867—say, $391,377—the works, besides paying back to the city its entire outlay for grounds, buildings, plant, pipes, and all other appurtenances, have a surplus to their credit of $135,906. This must be still further increased by the difference between the value of the gas furnished to the city for public consumption, and the interest allowed by the city on the cost of works—say, $358,074—making a total surplus of $493,980, after repaying the city for its investment. The actual results are that the city owns its gas-works, with the entire outfit, without cost, and has received a bonus of $493,980."



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Newport (Mon.) Water Supply.—The annual visit of inspection to Wentwood was made on Monday last week by the members of the Water-Works Committee of the Newport Corporation. The first point reached was the north intake, where about 120,000 gallons per day were found ready to run into the 3-feet tunnel. The party then followed the course of the tunnel to the point where it reaches the main reservoir. Here it is 6 feet high. Satisfaction was expressed at the fact that the stone pitching of the base of the embankment had been commenced, and that the mains had been laid through the embankment tunnel. Alderman Goldsworthy, Chairman of the Committee, speaking at the luncheon which followed, gave a brief history of the undertaking, and justified the action taken by the Corporation in January, 1896, when, the then contractor having thrown up the work, they stepped in and resolved to do it themselves by the direct employment of labour. Since then the Corporation had plodded on, and they hoped by this time next year to be able to show a completed undertaking; and then the borough would be placed beyond the fear of scarcity of water for many years to come.

Stafford Corporation Finances.—The Borough Accountant of Stafford (Mr. G. S. Parker) has just published his abstract of the accounts of the Corporation for the financial year ended the 25th of March. It shows that the total indebtedness of the borough at that date was £259,028, a net increase on the year of £8870, though there is a sum of more than £4800 standing in the sinking funds. The water-works are burdened with a debt of £43,279. The gross profit on the year was £2720; and after meeting various capital charges there was an available balance of £649, £600 of which was transferred to the district fund. On the gas-works there has been an outlay of £112,891, and the existing debt is £69,733. The gross profit was £8176; but owing to the reduced price of residuals, it was only possible to pay £750 to the credit of the district fund. The gross profit on the actual working of the electric light undertaking was £663; but this was not nearly sufficient to meet the whole of the capital charges, and a call has had to be made on the ratepayers for £1660. Last year was a "lean" one in regard to the municipal trading concerns; and it has been found necessary to levy a district rate of 5s. in the pound—an increase of 1s. 2d. on the year 1900-1.

An interim dividend of 15s. per share will be paid next Thursday by the Shanghai Water-Works Company, Limited.

We learn from Messrs. A. Benjamin & Co., of No. 31, St. Mary Axe, E.C., the brokers for the sale of the oils imported by the "Shell" Transport and Trading Company, that the first cargo of Texas kerosene imported into this country is due to arrive here somewhere about to-day; and continuous supplies are likely to come forward in future.

Messrs. Joseph Taylor and Co., of Bolton, have received an order from the Widnes Corporation Gas Department for a 1¼-inch solid-plate lead saturator, with 1¾-inch plate-lead well, for steam discharger, and to be fitted with double detachable ammonia pipes and detachable acid pipe. The saturator will be braced with stout pitch pine laggings.

The Gas Committee of the Glasgow Corporation have entered into the following contracts for their new gas-works at Provan: Two station meters, in square cast-iron cases, to pass 250,000 cubic feet of gas per hour, Messrs. R. Laidlaw and Son, Limited, £3628; one meter to pass a similar quantity of gas, Messrs. James Milne and Son, Limited, £1900; and two horizontal compound hydraulic pumping-machines and accumulators, £1888. The station meters will be the largest in use in Scotland.

At the second general meeting of the Diesel Engine Company last Friday, the Chairman (Mr. W. Oppenheimer), in moving the adoption of the report, said when the Company was started there were numerous Diesel oil-engines running, chiefly in Germany and Russia, on the "Otto" cycle principle. These engines were giving, according to all reports, extreme satisfaction; and Mr. Diesel at the time recommended them very strongly to put engines of this pattern on the English market. The experts, however, were of opinion that English buyers would never accept a four-stroke engine. The Directors nevertheless decided to put the engine on the market, as suggested. The first one delivered was of 40 brake horse power, for the purpose of pumping at a sewage farm. They had also an engine of 30 brake horse power running. He personally had put down a small 10-horse engine at his Company's works. At full load, this engine ran at a cost of 1d. per hour, which, it would be agreed, was a marvellous achievement. The amount saved in the cost of running would within two years pay for the engines themselves. The report was adopted.

At the annual meeting of the London Labour Conciliation and Arbitration Board on Monday last week, at which 40 delegates, representing some 24 Trade Unions, were present, the Chairman (Mr. S. B. Boulton) stated that the annual report showed that fewer cases than usual had been adjudicated upon during the year. From one point of view, this was a happy state of things, in so far as it indicated fewer disagreements. The number of trade disputes in the whole of the United Kingdom had decreased from 926 in 1896 to 624 in 1901. He attributed this to the progress made in the wider adoption of the principle of conciliation. According to the Board of Trade returns, since 1890, when the London Board was formed, there had been organized over the country eight district and eight trade Boards of Conciliation. In the Metropolis, 12 trade Boards or Committees had been formed. The London Labour Conciliation and Arbitration Board had founded machinery which had worked without a hitch. Instead of matters in dispute being handed over to particular arbitrators, they were referred to a "panel" of workmen and employers meeting together on equal terms, but all men who had shown themselves capable of dealing with labour disputes, and not themselves interested in the matter to be adjudicated upon. There had not been a single case in which the award had not been loyally received. There were 12 Trade Boards formed in London; and he desired that these should federate themselves with the Conciliation Board. He suggested that the time had arrived when a national conference of representatives of Conciliation Boards should be held in London.

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